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Towards a more refined and integrative view on athletes' motivation and coaches' motivating style

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Chapter 1

Towards a More Refined and Integrative View on Athletes' Motivation and Coaches' Motivating Style: A General Introduction

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Introduction

Sport participation comes with a host of physical and psychological benefits among both youth and adults. Specifically, participation in sport has been associated with better physical fitness (Larsen et al., 2017), greater self-esteem (e.g., Calfas & Taylor, 1994) and social competence (e.g., Haugen, Säfvenbom & Ommundsen, 2013), fewer symptoms of depression, anxiety and emotional distress (e.g., Asztalos, Bourdeaudhuij, & Cardon, 2009; Tomson, Pangrazi, Friedman, & Hutchison, 2003), and even with lower mortality (e.g., Löllgen, Böckenhoff, & Knapp, 2009). Despite these identified benefits, sport participation can also turn out to be harmful, at least for some athletes. To illustrate, athletes can get injured (Luke et al., 2011), display competitive anxiety (e.g., Barber, Sukhi, & White, 1999) and experience burnout (e.g., Lonsdale, Hodge & Rose, 2009), which can eventually lead to disengagement and drop-out (e.g., Butcher, Lindner, & Johns, 2002). Whether athletes benefit or, alternatively, pay a price for their sport participation may be partly traced down to *athletes' motivation* and *coaches' motivating style* (e.g., Chatzisarantis & Hagger, 2007; Ntoumanis, Taylor, & Thøgersen-Ntoumani, 2012).

Multiple theoretical frameworks, including Achievement Goal Theory (Duda, 1992; Dweck, 1986; Nicholls, 1984) and Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2017), have proven valuable to address athletes' motivation thereby paying attention to both the quantity and quality of motivation. Athletes' *quantity* of motivation – the degree to which an athlete is willing to act – can either be high or low, with highly motivated athletes putting more effort in their sports and more strongly adhering to their goal (Cox & Whaley, 2004). Put simply, from a quantitative viewpoint, motivation is treated as a unitary concept, with the assumption often being "the more an athlete is motivated, the better it is". Yet, from a qualitative viewpoint, motivation should be treated in a differentiated way, thereby distinguishing between different types of goals (e.g., Chatzisarantis & Hagger,

2007; Elliot & Thrash, 2001) and different types of motivation (Deci & Ryan, 2000), that can denote at least two different things. First, the direction at which athletes are aiming at and second, the different types of regulation that reflect the qualitative reasons underlying this direction.

Hence, theories on athletes' motivation should address two general questions, namely, *what* goal athletes are aiming at and *why* they chose precisely that goal. The current dissertation relies on two motivational frameworks that each typically address one of these questions independent of the other. That is, Achievement Goal Approach (Elliot, 2005), which focusses on the diversity in athletes' goals (i.e., "what"), and Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2017) which accounts for the diversity of athletes' behavioral regulation (i.e., "why"). Because each perspective emphasizes a particular aspect of the motivational process, integrating these frameworks becomes interesting. That is, using the strong points of one perspective to inform the other can further advance the development of motivational theories, and enhance our practical understanding of athletes' motivation and the intervening processes that determine whether one benefits or suffers from engaging in their sport.

Regarding the investigation of coaches' motivating style, we rely in the current dissertation on Self-Determination Theory. Through their motivating behaviors in training and competition, coaches can fundamentally influence the quality of their athletes' motivation and experiences in sport. Hence, it is vital to identify these key coaching behaviors. Yet, most of the work so far investigated coaches' motivating style at a very general level, in terms of stable differences in styles between coaches. Nevertheless, the reality is more complex and rather than being a stable coaching characteristic, coaching behavior is often adjusted to the situational circumstances and therefore may vary not only from game to game and from training day to training day but also from episode to episode within the same game or training session. With the present dissertation we aim to take into account this

complexity and provide more differentiated insights in coaches' motivating style.

The current introduction will present the two motivational frameworks that serve as the theoretical basis for this dissertation, that is, the Achievement Goal approach and the Self-Determination Theory. In the first part it will be elucidated how the concept of achievement goals has evolved throughout its history and how this evolution paved the way to integrate notions of Self-Determination Theory to obtain a more complete and integrative picture of athlete motivation. This first part will be concluded with an overview of the empirical evidence that shows how the integration of the two theories can provide a better understanding of motivational processes that have remained underexplored so far. In a second part, the introduction will turn to how Self-Determination Theory can also serve as the conceptualization of coaches' motivating styles. An overview of the various coaching behaviors that form these motivating styles will be presented, together with empirical evidence about its importance. The third and final part of this introduction, will conclude with the objectives of the dissertation and how these objectives can enhance our understanding of athletes' motivation and coaches' motivating style.

1. Athlete Motivation: A Matter of "What" and "Why"

1.1. Achievement Goal Approach: The Direction of Achievement Motivation

Work on achievement goals dates back to the early 1980s when a family of related frameworks has been developed to better understand how individuals interpret, experience, and behave in achievement situations (Ames, 1992; Dweck, 1986; Maehr, & Midgley, 1991; Maehr & Pintrich, 1991; Nicholls, 1984). Working independently from one another, pioneering scholars Dweck, Maehr, Midgley, Nicholls, and Pintrich developed a similar

view on achievement motivation dynamics (Dweck; 1986; Nicholls, 1984), which got studied in the domain of both education (e.g., Ames & Archer, 1988; Anderman & Patrick, 2012) and sports (e.g., Duda, 1992; Duda, Fox, Biddle, & Armstrong, 1992). According to Achievement Goal Theory, achievement-related behavior is motivated by an achievement goal, which reflects the *purpose* for which individuals behave in an achievement situation.

Central to the definition of achievement goals is the way individuals define and extract a sense of competence. Depending on the type of chosen achievement goal (e.g., aiming to outperform others or improving one's skills), athletes define competence very differently, with resulting consequences for their affective, cognitive, and behavioral functioning in an achievement situation (e.g., Elliot, 2005). Over the past four decades, at least two important evolutions marked the literature on achievement goals. First, the number of achievement goals was gradually extended from originally two to nowadays six different achievement goals. Second, the conceptualization of achievement goals became increasingly more restricted and narrow, with achievement goals being initially more broadly defined as orientations (Dweck, 1986) and nowadays being considered as reflecting specific goal standards (Elliot & Thrash, 2001). These two evolutions occurred simultaneously and are important for the present dissertation because they paved the way towards the integration of the "what" and "why" of achievement goal pursuit. Therefore, we explain both evolutions in more detail hereafter.

Table 1: Overview of achievement goal terminology.

Framework	**Reference**	**Terminology**
Dichotomous	Nicholls (1984)	Task versus Ego involvements
Dichotomous	Dweck (1986)	Learning versus Performance goals
Dichotomous	Duda (1992)	Task versus Ego orientations
Trichotomous	Elliot & Harackiewicz (1996)	Mastery, Performance-approach, Performance-avoidance goals
2x2 framework	Elliot & Thrash (2001)	Mastery-approach, Mastery-avoidance, Performance-approach, Performance-avoidance goals
3x2 framework	Elliot, Murayama, & Pekrun (2011)	Task-approach, Task-avoidance, Self-approach, Self-avoidance, Other-approach, Other-avoidance goals
	The current dissertation	Task-approach, Task-avoidance, Intrapersonal-approach, Intrapersonal-avoidance, Interpersonal-approach, Interpersonal-avoidance.

1.1.1. A Gradual Extension of the Number of Achievement Goals

The dichotomous framework. In the early dichotomous Achievement Goal Theory, two distinct classes of dispositional *goal orientation* or two states of achievement *goal involvement* (Dweck, 1986; Nicholls, 1984) received attention. Dweck and Nicholls used different nomenclature to point toward basically the same concepts. Dweck preferred the 'learning versus performance' distinction, whereas Nicholls used the distinction 'task versus ego' (see Table 1 for an overview of different terminologies). The current introduction will refer to a third kind of terminology, the mastery-performance distinction (Elliot & Thrash, 2001), as these terms are conceptually clearer and more widely used in the achievement goal literature.

Setting aside the different terminology, achievement goal theorists agreed on the concepts of mastery and performance goals. When adopting a mastery goal orientation, or being task involved, individuals focus on acquiring and developing their competence. Their view on competence is based upon task-based or intrapersonal-related standards and effort-expenditure is seen as essential for acquiring competence and becoming more skilled. For instance, an athlete on the long jump may aim to jump as far as he possible can or further than ever before. Contrary, when individuals are performance-oriented or ego-involved, they focus on demonstrating competence relative the others, either by outperforming others or avoiding doing worse than others. For instance, a performance-oriented athlete may aim to jump further than one specific or any other athlete in competition. As outperforming others with a minimal amount of effort signals higher ability, effort is appraised rather negatively. While mastery-oriented individuals would maximize their effort to accelerate their competence development, performance-oriented individuals would minimize effort because – in their view – high effort-expenditure to attain the same outcome as another person reflects lower ability (Ames, 1992; Dweck, 1986; Elliot & Hulleman, 2017; Nicholls, 1984).

Consistent with these distinct foci, the two achievement goals were hypothesized to bring about a distinct pattern of outcomes (Dweck & Legett, 1988; Elliot & Hulleman, 2017; Harwood, Spray & Keegan, 2008). Early cross-sectional, experimental and longitudinal studies in the context of sports clearly supported the premises concerning achievement goal orientations. For instance, a mastery orientation has been associated with the belief that success stems from athletes' invested effort and is attained through cooperation. Contrary, a performance orientation has been associated to the belief that success stems from possessing superior ability, and to the use of deceptive strategies (Duda et al., 1992; Treasure & Roberts, 1994; Van Yperen & Duda, 1999).

Further, goal orientations have also been investigated in relation to motivational outcomes. For example, a mastery orientation has been consistently linked with more intrinsic motivation in athletes, as indexed by experiences of flow (Jackson & Roberts, 1992) as well as greater task interest, more enjoyment, and less boredom (e.g., Duda et al., 1992; Duda, Chi, & Newton, 1990; Duda, Chi, Newton, Walling, & Catley, 1995). In contrast, a performance orientation has shown either negative (Duda et al., 1990) or null correlations (Duda et al., 1995) with intrinsic motivation. Experimental studies found an induced state of mastery goal involvement, relative to a performance goal involvement, to lead to longer free-choice behavior, which is considered as a behavioral indicator of intrinsic motivation (e.g., Vallerand, Gauvin, & Halliwell, 1986).

Numerous studies have linked athletes' goal orientation to emotion-related outcomes (e.g., Dewar, & Kavussanu, 2011; Hall & Kerr, 1997; Ommundsen & Pederson, 1999). For instance, a meta-analysis involving 37 studies on the association between goal orientations and sport-related affect (Ntoumanis & Biddle, 1999) indicated that a mastery orientation related positively to positive affect and negatively to negative affect (see also Dewar & Kavussanu, 2011), while a performance orientation was related positively to negative affect, only. Both goal orientations also yielded a differential

relation to emotional outcomes during competitive events. For example, cross country runners with a high mastery orientation reported more confidence, while runners with a performance orientation declared more anxiety prior to a competitive event (Hall, Kerr, & Matthews, 1998). Further, performance-oriented athletes have been found to lean toward emotion-focused strategies, such as getting upset and chocking, to cope with difficulties, whereas the mastery-oriented athletes appeared to be inclined to use problem-solving coping strategies including putting more effort and finding social support (Ntoumanis, Biddle, & Haddock, 1999).

Going beyond traditional motivational and emotional outcomes, a cross-sectional study with basketball players indicated that a performance orientation was positively linked to higher scores on legitimizing the act of injuring an opponent in order to win the game (Duda, Olson, & Templin, 1991). The latter was confirmed in male elite youth ice hockey players (Dunn & Dunn, 1999). Players high in performance orientation were more inclined to endorse aggressive behaviors, whereas those high in mastery orientation reported greater sportspersonship.

Concerning athlete performance, a longitudinal study showed that a mastery orientation at the beginning of the competitive season positively predicted athletes' progress, as rated by the coach at the end of the season. However, a performance orientation showed a null correlation with this performance indicator (Van Yperen & Duda, 1999). Finally, some other studies have shown that *both* mastery and performance orientation are associated with performance, as indexed by running improvement among female runners (Tenenbaum, Spence, & Christensen, 1999) and self-rated performance among golfers (Dewar & Kavussanu, 2011).

The trichotomous framework. A decade after the introduction of the framework, Elliot and colleagues (Elliot, 1999; Elliot & Harackiewicz, 1996) pled for a differentiation of the performance goal construct, thereby distinguishing between performance-*approach* and performance-*avoidance*

goals. Historically, the approach-avoidance distinction had been central to the work on achievement motivation (e.g., Atkinson, 1957; McClelland, Atkinson, Clark & Lowell, 1953), and refers to the question of whether one appraises competence positively or negatively. That is, whether one, respectively, approaches a situation to attain success or averts a situation to avoid failure. The approach-avoidance distinction, was considered essential to obtain a fuller understanding of individuals' motivated behavior in achievement settings and therefore received a more prominent place within the achievement goal framework. Moreover, apart from the definition of competence, the *valence* of competence was introduced as a second dimension of the achievement goal construct. Specifically, this dimension denotes whether one enters an achievement situation to attain competence (i.e., approach success) or to avoid incompetence (i.e., avoid failure; Elliot, 1999). This valence dimension of competence was first only applied to the performance goal orientation (not the mastery goal orientation), leading to the emergence of a trichotomous achievement goal model (Elliot & Harackiewicz, 1996). Hence, athletes could strive to attain mastery (i.e., mastery goals), strive to outperform others (i.e., performance-approach goals) or strive to avoid performing worse than others (i.e., performance-avoidance goals).

Only few studies on the trichotomous achievement goal model have been conducted in the sport domain. Presumably because shortly after this extension, a full 2x2 model was developed, thereby applying the approach-avoidance distinction across both performance and mastery goals (Elliot & McGregor, 2001). Nevertheless, the available research shows distinctive correlates for performance-approach and performance-avoidance goals. To illustrate, in the domain of physical education, both performance goals were positively associated with the belief that sport ability is a fixed characteristic (i.e., entity belief) and negatively associated to the belief that ability is malleable (i.e., incremental belief). Yet, whereas performance-approach goals related positively, performance-avoidance goals related negatively to

perceived competence (Cury, Da Fonseca, Rufo, & Sarrazin, 2002). Further, performance-approach goals have been associated negatively, whereas performance-avoidance goals have been associated positively with self-handicapping (Ommundsen, 2004). Mastery goals (which were left undifferentiated with respect to the approach-avoidance distinction) showed the expected pattern of relations and, thus, related positively to incremental beliefs and perceptions of competence (Cury et al., 2002), and negatively to self-handicapping (Ommundsen, 2004). Finally, an experimental study among male students using a basketball dribbling task (Cury, Da Fonseca, Peres, Rufo, & Sarrazin, 2003) provided causal evidence for the maladaptive impact of performance-avoidance goals on a set of outcomes. Specifically, participants in the performance-avoidance goal condition reported less desire to feel competent on the dribbling task, less task absorption, and more state anxiety compared to participants in both the performance-approach and mastery goal conditions, who did not differ significantly on these variables. Taken together, under the trichotomous model, performance-approach goals revealed a more positive pattern to achievement-related outcomes than performance-avoidance goals.

The 2x2 framework. Later, in the beginning of the new millennium, the approach-avoidance distinction was also applied to mastery goals (cf., Elliot & McGregor, 2001). By fully crossing the valence dimension of competence (i.e., approach versus avoidance) with the definition dimension of competence (i.e., mastery versus performance), four different achievement goals were discerned, forming the 2x2 achievement goal framework (Conroy, Elliot, & Hofer, 2003; Elliot & McGregor, 2001). The goals within this framework involved a mastery-approach goal (i.e., aiming to improve competence or master skills), a mastery-avoidance goal (i.e., avoiding stagnation or to do worse than one possibly could), a performance-approach (i.e., aiming to perform better than others), and a performance-avoidance goals (i.e., avoiding to perform worse than others).

Empirical results supported the usefulness of differentiating both types of mastery goals. As observed in earlier work, mastery-approach goals were associated with an array of desirable outcomes, including intrinsic motivation (e.g., Li, et al., 2011), enjoyment (Morris & Kavussanu, 2009), self-esteem (Adie, Duda, & Ntoumanis, 2010), positive emotions (e.g., Adie et al., 2010; Puente-Diaz, 2013), and the use of more positive and less negative self-talk (e.g., Zourbanos, Papaioannou, Argyropoulou, Hatzigeorgiadis, 2014). Also, mastery-approach goals were found to relate positively to mental toughness, appraising competition as a challenge and negatively to cognitive anxiety and a threat appraisal of competition (e.g., Adie et al., 2010; Gucciardi, 2010; Morris & Kavussanu, 2009; Nicholls, Perry, & Calmeiro, 2014). In stark contrast with these correlates, mastery-avoidance goals yielded a much more negative pattern of relations to these correlates, as they were related negatively to self-esteem and mental toughness, and positively to fear of failure, cognitive anxiety, and threat appraisals (e.g., Adie et al., 2010; Conroy & Elliot, 2004; Gucciardi, 2010; Morris & Kavussanu, 2009; Nicholls et al., 2014).

As was the case in the trichotomous achievement goal framework, performance-avoidance goals were associated with a general negative pattern of results, as evidenced by positive relations with fear of failure, threat appraisals, and cognitive anxiety (Adie et al., 2010; Conroy & Elliot, 2004; Morris & Kavussanu, 2009; Nicholls et al., 2014). While the correlates of performance-avoidance goals were invariantly negative, those for performance-approach goals appeared to be more mixed, suggesting that the pursuit of performance-approach goal is a mixed blessing. To illustrate, performance-approach goals related positively with desirable outcomes, such as positive affect, challenge appraisals, and mental toughness, but also with more undesirable outcomes, such as fear of failure, negative affect and threat appraisals (Adie, Duda, & Ntoumanis, 2008; Adie et al., 2010; Conroy & Elliot, 2004; Gucciardi, 2010; Puente-Diaz, 2013). Finally, as for performance outcomes, a recent meta-analysis in the sport domain found approach goals to

be superior to avoidance goals with both mastery-approach and performance-approach goals being equally effective in the prediction of objective or other-rated performance (Lochbaum & Gottardy, 2015; Van Yperen, Blaga, & Postmes, 2014). In contrast, both mastery-avoidance and performance-avoidance goals showed a non-significant association with performance in the sport domain.

The 3x2 framework. A final extension of the number of achievement goals occurred when Elliot and colleagues (Elliot, Pekrun, & Murayama, 2011) introduced the 3x2 achievement goal model. This was achieved by breaking down the mastery goal concept into two subtypes, depending on whether competence is defined with task-based or self-reference criteria. These two different standards, that had been initially used to define mastery goals, were now separated. While the task-based standards concern the focus on how one is doing relative to the absolute demands of the task, intrapersonal standards refer to the focus of how one is doing relative to one's own trajectory and potential future accomplishments (Elliot et al., 2011). To illustrate, a soccer player pursuing task-based standards may aim to get a lot of shots on target, while a player pursuing intrapersonal standards may aim to get more shots on target than she did last game. Hence, *intrapersonal goals* (with an intrapersonal standard) got differentiated from *task goal*s (with a task-based standard) and both were different from *interpersonal goals* (with an interpersonal standard)[1]. Crossing these three standards of competence with the approach-avoidance tendency resulted in the 3x2 achievement goal model describing six distinct achievement goals (Elliot et al., 2011; Mascret, Elliot, & Cury, 2015), indicated by new terminology (Figure 1).

[1] Elliot et al., (2011) used the terms 'self-goal', 'task-goal', and 'other-goal' to refer to goals with an intrapersonal, task-based and interpersonal standard, respectively. The present dissertation intentionally refrains from the use of the term 'self-goal' to avoid confusion with the term "the self" as used in Self-Determination Theory to denote "the initiator and regulator of volitional behavior" (Ryan & Deci, 2017; pp. 52).

Empirical evidence concerning the 3x2 achievement goals and their correlates in sport domain is very scarce. The few studies that endorsed the 3x2 framework have shown both task-approach and intrapersonal-approach goals to relate positively to task interest, incremental beliefs about ability and adaptive perfectionistic strivings (Madigan, Stoeber, & Passfield, 2017; Mascret et al., 2015). Further, task-approach goals, but not intrapersonal-approach goals, have been found to associate positively with perceived competence (Mascret et al., 2015). As for task-avoidance and intrapersonal-avoidance goals, these were found to relate positively to maladaptive perfectionistic concerns and negatively to more adaptive perfectionistic strivings (Madigan et al., 2017). Distinguishing intrapersonal standards from task-based standards is interesting in the domain of sports, because athletes may very well strive for performance improvement, instead of merely task mastery.

		Definition		
		Intrapersonal standard	Task-based standard	Interpersonal standard
Valence	Approaching success	Intrapersonal-approach goal	Task-approach goal	Interpersonal-approach goal
	Avoiding failure	Intrapersonal-avoidance goal	Task-avoidance goal	Interpersonal-avoidance goal

Figure 1: 3x2 achievement goal model. Definition and valence represent the two dimensions of competence (Figure based on Elliot et al., 2011).

1.1.2. Reconceptualization of Achievement Goals: Conceptual Precision

Apart from the gradual extension of the number of goals, another important evolution occurred within the achievement goal model: one of *conceptual refinement*. Early achievement goal theorist agreed that an achievement goal denoted the *purpose* of individuals' achievement behavior. Elliot and Thrash (2001) pointed out that it is unclear whether this 'purpose' denotes the *aim* or the *reason* for behaving in achievement situations. For example, in the initial conceptualization of achievement goals (Dweck, 1986; Nicholls, 1984), performance-oriented individuals were considered ego-involved as they aimed to outperform their peers (i.e., the aim) to maintain or boost their self-worth (i.e., the reason). Hence, subsequent achievement goal theorists varied in whether they considered the aim, the reasons or a combination of both as part of their definition and operationalization of achievement goals. As illustrated by the example above, within the dichotomous and trichotomous models, achievement goals were treated as rather broad omnibus constructs. In this *macro-approach* to achievement goals, the aims (e.g., outperforming others) were conceptually interwoven with reasons (e.g., ego-concerns) in achievement situations (Elliot & Thrash, 2001; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010; Vansteenkiste, Lens, Elliot, Soenens, & Mouratidis, 2014). Elliot and Thrash (2001) instead argued in favor of a *micro-approach* and maintained that, to obtain greater operational precision, achievement goals should be conceptualized in a more restrictive way, that is, as reflecting purely *aims*. Thus, any reasons for pursuing a given aim needed being detached from the definition and operationalization, to yield a narrower, yet more precise definition of the achievement goal construct. In sum, the goal was operationally defined solely as an aim, according to how competence is defined and valenced.

Detaching the reasons from the aims of achievement goals yields several conceptual and empirical advantages (see Vansteenkiste, Lens et al., 2014). First, a more circumscribed definition of the achievement goal

construct allows for more conceptual precision and a more unambiguous operationalization. That is, in the macro-tradition, the operationalization of achievement goals captured diverse aspects (i.e., aim, reason) to different degrees, which may produce variability in the obtained findings, depending on how these two aspects are incorporated in the operational definition. In fact, a meta-analysis on 243 achievement goal studies across the educational, work, and sport domain (Hulleman et al., 2010) pointed out that the pattern of relations of performance-approach goals to motivational correlates depended upon how the performance-approach goals were assessed. When the performance-approach goal measure focused exclusively on normative standards (i.e., outperforming others; the aim), performance-approach goals were found to relate positively to achievement ($\hat{r}$ = .14). Yet, when the performance-approach goal measure additionally included a reference to some reasons such as ego-validation concerns (e.g., to outperform others to prove ability; the reason), performance-approach goals were found to relate negatively to achievement ($\hat{r}$ = -.14) (see also Senko & Dawson, 2017). Likewise, when the mastery-approach goal measure referred to learning, improving or mastering a task (i.e., intrapersonal or task-based standards, e.g., "Understanding how to use the new technique is important to me"), mastery-approach goals were found to relate positively to both performance ($\hat{r}$ = .05) and interest ($\hat{r}$ = .35). Further, when the measure predominantly referred to learning in general (e.g., "…I like to learn new things") without a specific task-relevance, or to doing something out of interest, the mastery-approach goals were found to relate more strongly to both performance ($\hat{r}$ = .14) and interest ($\hat{r}$ = .58).

Second, when assessing the aims and reasons separately, it becomes possible to gain precise insight in which aspect (i.e., the aim or the reason) accounts for the observed effects of the omnibus operationalization (Vansteenkiste, Lens et al., 2014). In addition, the interactive interplay between both aspects can be studied as the meaning assigned to the standard may well differ depending on the reasons underlying its pursuit, such that both

aspects, in tandem, explain additional variance in the outcomes. In contrast, when assessed simultaneously under the notion of a singly omnibus construct, it is impossible to find out whether the aim, the reason, or the interactive combination of both accounts for variation in outcomes.

Third, the detachment of reasons from aims also yields potential theoretical benefits. That is, when construed as an omnibus construct, performance-approach goals were assumed to be invariantly driven by one single reason, that is, ego-validating concerns. Individuals would aim to outperform others to prove their ability and self-worth. Although ego concerns may be an important reason underlying individuals' goal to outperform others, a performance-approach goal can be pursued for numerous other reasons, such as the promise of a reward (e.g., a bonus for winning) or because outperforming others is perceived as a challenge. Importantly, when restricting the definition of achievement goals to the pursuit of a specific set of standards, ego-concerns can also underlie the pursuit of other standards, including a mastery-approach goal. To illustrate, a high jump athlete may focus on outperforming others to prove her ability. Yet, such ego-concerns may also be the driving force behind her aim to jump as high as possible or higher than before. Likewise, a mastery-approach goal may not be exclusively pursued out of pleasure or excitement (Dompnier, Darnon, & Butera, 2009). Instead, external pressures can undergird this particular goal as well. For instance, a snowboarder could feel pressured by the threat of being no longer selected for the elite team if he fails to make sufficient progress. Therefore, the more restrictive definition of achievement goals to aims only, allows scholars to move beyond 'classic' reason-aim combinations (i.e., normative goals in combination with ego-concerns; task-based goals in combination with enjoyment), instead considering a multitude of different combinations of aims and reasons (Vansteenkiste, Lens et al., 2014).

That is, the detachment of the reasons (i.e., the "why") from achievement goals (the "what") allows for the consideration of other well-known motivational theories to conceptualize the diversity in the "why" of

achievement goals. According to Vansteenkiste and colleagues (2014; Vansteenkiste & Mouratidis, 2016), Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2017), a framework of human motivation is particularly well suited to serve this purpose, because of its tradition in studying individual's activity engagement (e.g., Ryan & Connell, 1989) and goal pursuit (e.g., Sheldon, 2002). We now turn to this well-established theory on motivational regulations.

1.2. Self-Determination Theory: The Regulation of Achievement Goals

Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2017) is a broad theory on human motivation and development. The framework distinguishes several behavioral regulations that can underlie individuals' task participation and goal striving, in particular (Deci & Ryan, 2000). These behavioral regulations denote different qualities of motivation to act, resulting in behavior that differs in degree of self-determination (Figure 2). In the present dissertation, these regulations will specifically serve as *goal regulations*, or else, as the underlying reasons for athletes' achievement goal pursuit.

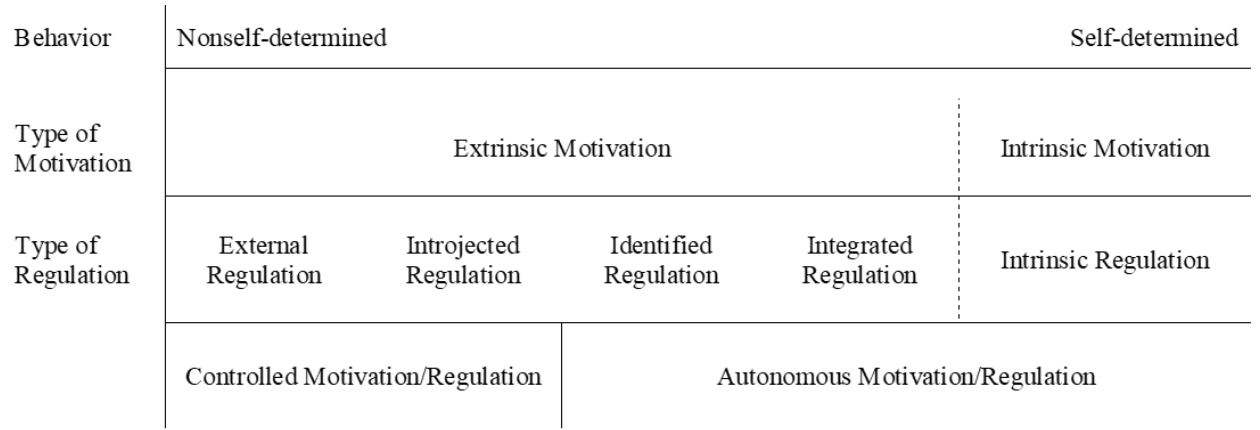

Figure 2: The self-determination continuum (adapted from Deci & Ryan, 2000)

1.2.1. Intrinsic Motivation and Internalization

At the core of the theory, SDT postulates that individuals have an inherent tendency toward psychological growth and development, which manifests through individuals' engagement in *intrinsically motivating* activities and their increasing *internalization* or *ownership* of extrinsically motivated activities. Intrinsic motivation occurs when one engages in an activity or behavior for its own sake, that is, because the activity or goal pursuit is experienced as inherently interesting, novel, and optimally challenging (Deci & Ryan, 2000). In its core, sport has inherent intrinsic qualities such as being physically active, building new skills, pursuing a shared goal with important others etc. Because of these intrinsic assets, athletes can easily find themselves intrinsically motivated for sport participation. Nevertheless, there are also moments when sport requires hard labor during daily training. For example, when an athlete needs to repeat boring drills, when she tries to recover from an injury, when she pursues unattainable standards, and when despite her efforts she experiences inevitable defeat (e.g., Reeve & Deci, 1996; Reeve, Olson, & Cole, 1985). In such instances, intrinsic motivation cannot sufficiently explain athlete behavior, while extrinsic motivation is better suited for this.

Extrinsic motivation occurs when the activity or goal serves as a means to attain an outcome which is separable from the activity or goal striving itself. As extrinsically motivated or instrumental behaviors and goal pursuits can be internalized to different degrees, SDT moves beyond the more classic intrinsic-extrinsic motivation distinction. That is, in case of the active transformation of externally motivated activities into personally endorsed values and self-regulations (Ryan, Connell, & Deci, 1985), individuals are said to engage in the activity with a greater sense of willingness, despite its extrinsic character.

Autonomous and controlled regulation. Optimal functioning is achieved if extrinsically motivated activities are fully internalized and integrated in the individuals' self, signaling a high level of acceptance and volitional or *autonomous* commitment. However, when the reason for activity participation and goal pursuit is not internalized or only partially internalized, the activity or goal pursuit at hand is not fully endorsed by the athletes such that athletes will feel rather *controlled* or pressured to take up the activity. When these two growth-oriented processes (i.e., intrinsic motivation and internalization) are operative, they give rise to distinct types of behavioral regulations, which inform us on the quality and the self-determined nature of individuals' motives for action and goal pursuit (Figure 2).

Within SDT, individual differences in the quality of motivation have mostly been studied in relation to a specific activity, like participating in sport (Pelletier, Fortier, Vallerand, & Brière, 2001), being physically active (Teixeira, Carraça, Markland, Silva & Ryan, 2012), or putting effort in one's work (Gagné et al., 2015). Concerning sport participation, the quality of athletes' motivation predicted athletes' engagement (Fenton, Duda, & Barrett, 2016), persistence (Sarrazin, Vallerand, Guillet, Pelletier & Cury, 2002), and performance (Gillet, Vallerand, Amoura & Baldes, 2010). Even athletes' moral behavior on the pitch (Hodge & Lonsdale, 2011; Ntoumanis & Standage, 2009) and their attitude toward cheating and doping use (e.g., Ring & Kavussanu, 2017) have been linked with the motivation that triggers athletes in their sport.

The self-concordance model. Yet, athletes can not only have qualitatively different motives for participating in their sports in general, but also for pursuing more specific short-term and long-term goals. Much as individuals' behavior can be autonomously or controlled motivated, this is also the case for individuals' goal striving. The self-concordance model was developed by Sheldon and colleagues (Sheldon & Elliot, 1998; 1999) to study in greater detail the reasons underlying individuals' idiographic goal striving.

More precise, the model hypothesizes that the more individuals pursue their goal for autonomous or so-called self-concordant reasons, the higher the probability of goal attainment and associated satisfaction, which, in turn, results in higher well-being. In contrast, when goal pursuits are controlled motivated, or non-self-concordant, individuals may put initial effort in their goal striving, but their efforts are not sustained over time. The self-concordance model has also received a great deal of attention within the sport domain (e.g., Ntoumanis et al., 2014; Ntoumanis, Healy, Sedikides, Smith, & Duda, 2014; Smith, Ntoumanis, Duda, & Vansteenkiste, 2011), which requires athletes to generate their own personal goals for a given time frame (e.g., improving my technique; running faster than my teammates) and to rate the different reasons underlying their goal pursuit. As such, an idiographic component is built into the research design.

Using the self-concordance model as a starting point where self-generated goals can be pursued for relatively autonomous or controlled reasons, Vansteenkiste, Mouratidis and Lens (2010) proposed that achievement goals, now narrowly defined as pure aims, can also be examined along with the reasons underlying their pursuit. Because of their focus on achievement and success, achievement goals are very relevant to study in the domain of sports. However, without knowledge of why athletes strive to achieve these standards, one is missing part of the motivational picture. Hence, the current dissertation integrates both frameworks in a way that the behavior regulations (cf. Self-Determination Theory) represent the qualitative reasons underlying athletes' aim of achieving a standard of competence (cf. Achievement Goal Approach), which allows for a more comprehensive picture of athletes' achievement motivation and the underlying processes that offer achievement goals their significance in sport.

1.2.2. Autonomous and Controlled Regulations of Achievement Goal Pursuit

Because athletes' extrinsic motives underlying their achievement goal pursuit can be internalized to different degrees, different types of extrinsically motivated achievement goal pursuit are discerned. These types of extrinsic motivation can be situated, together with intrinsic motivation, on a continuum of increasing self-determination. As can be noticed in Figure 2, the least self-determined type of extrinsic motivation is *external regulation*. External regulation involves the classic case of extrinsic motivation in which athletes' achievement goal pursuit is driven by external contingencies (Deci & Ryan, 2000; Ryan & Deci, 2017), such as the promise of a reward or the threat of punishments. For instance, if soccer players are only given a bonus for beating another team, their performance-approach goal pursuit is said to be externally regulated. The reason for pursuing an achievement goal is not internalized at all, as the goal pursuit is fully dependent upon externally pressuring factors. External regulation can be an effective base to steer and control behavior as long as the contingencies are operative. Yet, this form of regulation is fragile and unstable as athletes' efforts for continued achievement goal pursuit will likely fade when the reward or punishment is no longer operative.

Whereas external regulation is a form of extrinsic motivation that depends on external contingencies, *introjected regulation* denotes dependency on internal pressuring contingencies. That is, athletes' reason for achievement goal pursuit is now taken in, yet, the internalization is only partial. In the case of introjection, a pressuring and controlling force from within is guiding one's achievement goal pursuit, which athletes experience as 'a should' or 'a must' to avoid feelings of guilt, anxiety, and shame or to feel proud and worthy of themselves. A tennis player may be perfecting her service (task-based goal) to demonstrate her capacity and boost her ego. Because introjection is based on pressuring contingencies within the athlete (instead of the external environment) it tends to yield a more enduring effect than external regulation

(Ryan & Deci, 2017). Interestingly, introjected regulation seems particularly salient in sports. That is, the almost incessant exposure to performance-based evaluation, competition, and interpersonal comparison most likely tend to increase athletes' ego-concerns, self-consciousness and critical self-evaluation, all factors that catalyze introjected regulation (Ryan & Deci, 2017).

Next on the continuum is *identification*, the process of conscious endorsement of values and regulations (Ryan & Deci, 2017; Vansteenkiste et al., 2018). By identifying with the personal value of one's achievement goal pursuit, athletes more fully internalize its regulation and thus more fully accept it as their own. Identification constitutes a more autonomous or volitional form of regulation and athletes will often display a high level of commitment to their achievement goal in this case. To illustrate, a swimmer may put extra effort to beat his personal record (i.e., an intrapersonal-approach goal) as doing so allows him to move one step forward in his personal development and sport career. As athletes understand and fully endorse the value and importance of the achievement goal, identified regulation is said to represent a more stable form of behavioral regulation. That is, even in the face of difficulty and the encounter of obstacles, athletes may be more likely to persist and eventually attain their goals because they fully concur with the achievement goal (Deci & Ryan, 2000).

Finally, *integration* is the fullest, most complete form of internalized extrinsic motivation. It involves not only identifying with the importance of behavior, but also integrating those identifications with other aspects of the self (Deci & Ryan, 2000). Therefore, the achievement goal is not only valuable in its own right but its pursuit is also brought into alignment with other held values, aspirations, and interests. To illustrate, a basketball player may pursue the goal of outperforming all of her team mates on the agility course, because such increased nimbleness would be in line with her self-image of being a complete athlete. Under influence of integration, athletes

perceive the behavior to volitionally stem from within such that the behavior is self-determined and autonomously motivated.

As indicated above, SDT also distinguishes *intrinsic motivation*, the prototype of self-determined activity. When intrinsic reasons undergird achievement goal pursuit, the achievement goal is adhered to for the inherent qualities of the goal pursuit itself (e.g., interest, novelty, etc.). Intrinsic motivation is characterized by the lack of contingencies upon goal striving. To illustrate, a gymnast may aim to perfect a particular skill, because of the satisfaction he derives from practicing to get all the details right. Because satisfaction stems from the achievement goal pursuit itself, athletes experience full volition and self-determination while pursuing it.

In sum, intrinsic motivation for goal pursuit results in what is considered the most self-determined behavior. Under intrinsic motivation goal striving and achievement-related behavior is regulated autonomously, and athletes experience volition while performing it. Although integrated and identified regulations as reason underlying athletes' achievement goals are considered extrinsic, they are well internalized such that they more volitionally emanate from individuals' sense of self. Because of their high level of autonomy and volition, both identified and integrated regulation have been taken together with intrinsic motivation under the umbrella concept of *autonomous regulations*. In contrast, external regulation and introjection are both accompanied by a sense of pressure and internal conflict and are hence considered *controlled forms of regulations*.

1.3. Reasons Underlying Achievement Goal Pursuit: Overview of Empirical Evidence

Although the achievement goal approach and SDT formed the theoretical basis for hundreds of studies in the domain of sports, only few studies sought to combine both frameworks in a single study. Those studies mostly established empirical linkages between key concepts of both

frameworks (e.g., Duda, Chi, & Newton, 1990; Gao, Podlog, & Harrison, 2012; Standage, Duda, & Ntoumanis, 2003). To illustrate, several studies found mastery-oriented athletes to display more autonomous types of motivation for their sports, while performance-oriented athletes were more controlled motivated (Duda et al., 1990; Georgiadis, Biddle, & Chatzisarantis, 2001). In their conceptual overview, Vansteenkiste, Lens and colleagues (2014) suggested moving beyond such empirically linkages and moving towards greater synthesis. That is, they argued that, when achievement goals are viewed as pure aims, it becomes informative to study the autonomous and controlled reasons underlying individuals' achievement goal pursuit.

The importance of such synthesis lies in the notion that the distinct underlying reasons (autonomous versus controlled) for a specific achievement goal pursuit shape *the functional significance* (Deci & Ryan, 1985) of the achievement goal, thereby affecting its perceived meaning. As a result, the cognitive, affective and behavioral correlates of a given achievement goal may be very different depending on whether more autonomous or controlled reasons underlie its pursuit. For example, an athlete aiming to improve her personal best on the marathon (i.e., intrapersonal-approach goal) to prove to herself and others that she is an exceptionally talented athlete (i.e., controlled reason) may experience the upcoming race differently from an athlete who aims to improve her personal best because she perceives this goal as personally important and valuable (i.e., autonomous reason). In other words, depending on the reasons for pursuing the same achievement goal athletes may attribute a different meaning to the achievement goal. In case of controlled reasons, the achievement goal will likely be experienced as more evaluative and pressuring in nature as athlete's ego and self-worth and significant others' (e.g., coaches, parents, peers) regard is contingent upon the amount of goal progress and attainment. Contrary, when undergirded by autonomous reasons the informational value of the achievement goal is more salient, with the (lack of) goal progress and attainment containing useful information that may guide athletes' future goal striving.

Furthermore, the volitional or pressuring meaning athletes attribute to the achievement goal may not only influence athletes' meaning of the goal, but also instigate distinct intervening processes that eventually contribute to athletes' experience of and perhaps performance in competition. For instance, the marathon runner who aims to improve her personal best because of controlled reasons, may not only experience the goal as more pressuring, she may as well perceive the upcoming race as a threat to her self-esteem, respond with negative self-talk when she experiences difficulties during the race, and eventually underperform or drop out. Contrary, when the runner experiences her goal pursuit as more volitional, she may perceive the upcoming race as a challenge, use more positive self-talk to talk herself through the exhaustion, to end up performing as intended and perhaps even run a new personal best.

Empirical work employing this fairly new approach is still in its infancy, especially in the domain of sports. In an initial study in sports, Vansteenkiste, Mouratidis and Lens (2010; for a similar study in the education context, see Vansteenkiste, Smeets, et al., 2010) first assessed soccer players' strength of pursuing a performance-approach goal with items containing reference to only the interpersonal standards (e.g., my goal is to outperform my opponent). Subsequently, players' rated items probing their autonomous (e.g., "because I personally value this goal") and controlled reasons (e.g., "because others expect me to do so") for pursuing a performance-approach goal. As such, the strength of performance-approach goal pursuit and its underlying reasons were assessed separately as to examine their unique contribution. As hypothesized across the two cross-sectional studies, controlled reasons for pursuing a performance-approach goal related positively to an objectifying stance towards the opponent and self-reported antisocial behavior towards that opponent, but negatively to positive affect and vitality. In contrast, autonomous reasons underlying performance-approach goal pursuit were unrelated to these moral outcomes, whereas they related positively to positive affect and vitality. Interestingly, when taking into account the underlying regulations, the strength of the performance-approach

goal pursuit in itself was no longer related to any of these outcomes. At least in these data, the strength of performance-approach goal pursuit appeared a less robust predictor than its underlying reasons, testifying to the importance of considering the underlying reasons of achievement goal pursuit. Yet, one limitation of these studies was that only one type of goal was measured, while different reasons were taken into account.

Gaudreau and Braaten (2016) built upon this study and investigated the reasons underlying both interpersonal-approach and task-approach goals in a heterogeneous sample of athletes. Athletes' autonomous reasons underlying performance-approach goal pursuit were related to more positive affect and sport satisfaction and higher perceived goal attainment. The same pattern was evident concerning athletes' autonomous reasons for mastery-approach goal pursuit, although here also a negative association with negative affect was observed. Contrary, controlled reasons underlying both performance-approach and mastery-approach goals showed a more negative pattern of relations with these affective outcomes, but not with goal attainment. Two additional observations are important to note in relation to this study. First, the strength of *both* mastery-approach and performance-approach goal pursuit showed a positive pattern of results, indicating that – when the reasons are detached from the performance-approach aim – both mastery-approach and performance-approach goal pursuit can have positive correlates in terms of experienced affect, sport satisfaction, and goal attainment. Second, athletes' autonomous reasons interacted with both types of goal pursuit in such a way that the effects of goal strivings were even more positive for those athletes striving for highly autonomous reasons.

A third study of this kind in the sport context (Vansteenkiste, Mouratidis, Van Riet, & Lens, 2014) went beyond the existing cross-sectional findings to investigate, in a short-term repeated measure game-to-game study design, the game-to-game fluctuations in volleyball players' goal pursuit as well as their underlying autonomous and controlled reasons. In tapping players' achievement goals, these authors no longer made use of a continuous

measure but asked athletes to indicate their most dominant goal (Van Yperen, 2006). For this dominant and, hence salient, achievement goal, the athletes then rated the reasons underlying its pursuit. The authors reasoned that volley players may have one more dominant or salient achievement goal in mind during a specific game, such that it was deemed most useful to study the reasons underlying this achievement goal only. The findings indicated that players' dominant achievement goal as well as the underlying reasons fluctuated considerably from game to game. Further, during games players selected a dominant mastery-approach goal (i.e., absolute standards) they said behaving more prosocial towards their teammates, compared to the games they selected a dominant mastery-avoidance, performance-approach or performance-avoidance goal. Interestingly, players' dominant mastery-approach goal pursuit appeared particularly more common during these games than any of the other achievement goals. Hence, the researchers chose to only further investigate the reasons underlying mastery-approach goals. Specifically, when players selected a dominant mastery-approach goal, then the underlying autonomous reasons were positively associated with prosocial team behavior and feelings of enjoyment and satisfaction during that specific game.

1.4. Advancing the Research on The "What" and "Why" of Achievement Goals

Given the paucity of previous studies on the intersection between the Achievement Goal Approach and SDT, several issues deserve further attention. First, although mastery goals have been subject of analysis concerning the "what" and "why" of achievement goals, the available work is limited to the striving of task-based (i.e., absolute) standards. With the present dissertation we aim to build on this by investigating the 'what' and 'why' concerning athletes' intrapersonal achievement goal pursuit. The intrapersonal standard of competence carries substantial ecological validity in

sports. In fact, besides outperforming other athletes (interpersonal standards) or mastering a skill (task-based standards), also improving their own performance or skills may be of equal importance to athletes. Such an aim would be better captured by athletes' intrapersonal goal striving (i.e., self-goals according to Elliot et al., 2011).

Second, in the present dissertation we aim to provide more insight in the intervening psychological mechanisms that may explain the relations of the autonomous and controlled reasons underlying goal pursuit to athletes' affective, cognitive, and behavioral experiences in an achievement situation. This is an important issue because detecting these mediating processes may not only advance theory building concerning the "what" and "why" of achievement motivation, but it may also provide more detailed knowledge about what processes to target in a sport psychology intervention. As such, athletes' can be armed against the possible negative effects of a pressuring goal pursuit in competition and/or can be learned to exploit the positive effects of more volitional goal pursuit.

Third, setting aside the examination of typical emotional and motivational self-reported outcomes, we aim to examine the links of athletes' achievement strivings, and their underlying reasons, with perhaps the most valued outcome in sports contexts: sports performance. We aim to do so by assessing performance through objective and third-person ratings, and as such overcoming the well-known limitation of shared method-variance that stems from single-informant reports.

Fourth, in the present dissertation, we endorse the notion that athletes' goal adoption (i.e., the "what") and goal regulation (i.e., the "why") can vary considerably from game to game (Vansteenkiste, Mouratidis et al., 2014). This is an interesting observation in its own right that has been only sporadically investigated so far. Building on this scarce evidence which however took a retrospective approach, the present dissertation examines the dynamics of achievement goal pursuit and the underlying reasons as they develop before competition and athlete outcomes during competition. Thus, although there

may exist considerable between-athlete differences in their achievement goal pursuit across situations, the present dissertation uses a more dynamic, situation-specific approach (i.e., one particular competitive game) to study the links between achievement goals, their underlying reasons and affective and behavioral outcomes (including performance). As such, through this dissertation we try to better capture the particular facets and dynamics of an achievement situation.

To summarize, the present dissertation aims to advance the current field on the "what" and "why" of achievement goals by (a) focusing on the understudied intrapersonal goals, (b) shedding more light on the mechanism intervening between the "what" and "why" of achievement goals, (c) moving beyond self-reported outcomes by tapping into objective performance, and (d) using a more situation-specific approach by studying these achievement goal dynamics from game to game.

2. Supporting or Thwarting Athletes' Motivation: An Investigation into Coaching Behavior

It is widely accepted that coaches' interpersonal style of communication and behavior in training and competition influences the social environment which, in turn, shapes athletes' sport experiences and motivation (e.g., Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010; Mageau & Vallerand, 2003). According to Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2017), the satisfaction or frustration of athletes' basic psychological needs is crucial herein. Hence it, is also vital to identify the key coaching behaviors that may influence athletes' psychological needs and, in turn, athletes' motivation and experiences in sport.

2.1. Psychological Needs: The Nutriments of Optimal Development

It is maintained within SDT that, in order to fully understand athletes' goal directed behavior, personal development and well-being, one needs to take account of athletes' three basic psychological needs. These psychological needs are said to foster high-quality motivation underlying athlete's goal pursuit in general and achievement goal pursuit in particular (Deci & Ryan, 2000; Vansteenkiste, Lens et al., 2014). The first need is the *need for competence* and refers to the need to experience a sense of effectiveness and mastery (Ryan & Deci, 2017). When athletes have the feeling that their behavior leads to a desired outcome, their need for competence is fulfilled. The second need, the *need for autonomy*, reflects the need to self-regulate one's actions and to experience oneself as the agent of one's behavior. When athletes experience a sense of volition and psychological freedom, their need for autonomy is fulfilled. The *need for relatedness* is the third need and it refers to the need to feel cared for by and belonging to important others (Ryan, 1995; Ryan & Deci, 2017). When athletes feel well-connected to their team members and experience a sense of group harmony, their need for relatedness is fulfilled. SDT considers these three basic needs as "*innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being*" (Deci & Ryan, 2000; pp. 229). Ultimately, the extent to which athletes thrive, develop high-quality motivation, and actualize their potential is largely rooted in the extent to which athletes satisfy these three needs.

When these same psychological needs get frustrated, athletes feel coerced and pressured (i.e., autonomy), ineffective and like a failure (i.e., competence), and isolated and excluded (i.e., relatedness). Importantly, need frustration does not equal the absence or lack of need satisfaction as the psychological needs must be actively undermined for need frustration to be evident (Bartholomew, Ntoumanis, Ryan & Thøgersen-Ntoumani, 2011; Haerens, Aelterman, Vansteenkiste, Soenens & Van Petegem, 2015; Vansteenkiste & Ryan, 2013). Similarly, for athletes to thrive, their

psychological needs have to be fulfilled as the mere lack of need frustration does not suffice to promote development as such. Metaphorically stated, when deprived from its essential nutriment of water, a flower will stop growing. However, when exposed to poison it will quickly perish. In accordance, a flower needs much more than the mere absence of poison to be able to flourish. Congruent with the maintained distinctiveness between need satisfaction and need frustration, it is argued that especially athletes' high need frustration rather than their low need satisfaction puts them at risk for maladaptive athlete outcomes. That is, when athletes feel that one or more of their needs are frustrated, low-quality motivation, suboptimal development, maladaptive behavioral patterns and ill-being will occur (Bartholomew et al., 2011; Ryan & Deci, 2017; Vansteenkiste & Ryan, 2013).

Specifically, empirical cross-sectional and longitudinal evidence is abundant of the positive correlates of need satisfaction concerning athletes' motivational (e.g., autonomous motivation; Standage, Duda, & Ntoumanis, 2006), emotional (e.g., positive affect, subjective vitality; Gaudreau, Amiot, & Vallerand, 2009; Adie et al., 2008; Gagné, Ryan, & Bargmann, 2003), cognitive (e.g., self-esteem; González, García-Merita, Castillo, & Balaguer, 2016), and behavioral (engagement; Hodge, Lonsdale, & Jackson, 2009) outcomes. Contrary, a clear negative pattern of outcomes is apparent in relation to athletes' need frustration, as evidenced by positive association with burnout (e.g., Balaguer et al., 2012; Bartholomew et al., 2011), moral disengagement toward doping use (Ntoumanis, Barkoukis, Gucciardi, & King Chung Chan, 2017), and depression and disordered eating (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011).

2.2. Coaches' Need Support and Need Thwarting

A key figure who can influence the satisfaction and frustration of athletes' psychological needs and, as a result, also their sport-related motivation is the coach (e.g., Jowett & Cockerill, 2003; Langan, Lonsdale,

Blake, & Toner, 2015; Mageau & Vallerand, 2003). Congruent with the proclaimed critical role of athletes' need satisfaction and need frustration, coaches are capable of fostering or undermining athletes' need-based experiences by adopting a need-supportive or need thwarting coaching style. That is, coaches can shape practice sessions, competitive events and the coach-athlete interactions in such a way that athletes are more likely to satisfy their needs and less prone to experience need frustration (e.g., Mageau & Vallerand, 2003; Aelterman, De Muynck, Haerens, Van de Broeck, & Vansteenkiste, 2017; Haerens et al, 2018).

Based on years of research and theory building in a variety of life domains, including sports (e.g., Deci, Eghrari, Patrick, & Leone, 1994; Mageau & Vallerand, 2003; Reeve, 2016), SDT-based scholars identified multiple coaching behaviors that are considered to support or thwart athletes' psychological needs for autonomy, competence, and relatedness. Together, these behaviors form a need-supportive and a need-thwarting coaching style. The broader notion of coach need support involves three dimensions. The first dimension reflects autonomy support which gets often contrasted with coach control; the second dimension refers to structure, which gets often contrasted with chaos, and, the third dimension concerns warm coaching behavior with cold coaching considered as its counterpart (Mageau & Vallerand, 2003; Reeve, 2016). In the following, we discuss these coaching styles in greater detail, thereby clarifying the more specific coaching practices and behaviors they consist of and how they influence athletes' psychological needs, sport experience, and ultimately their performance.

Autonomy support and control. Autonomy-supportive coaching is by far the most investigated and, hence, most comprehensively described set of coaching practices. Autonomy support refers to the set of coaching behaviors that facilitate the congruence between athletes' autonomous sources of motivation (e.g., interest, values, goals) and the activity to perform at hand (Jang, Reeve, & Deci, 2010). Coaches who adopt an autonomy-supportive

style try to maximize athletes' sense of volition and psychological freedom by adopting a curious and accepting attitude (Aelterman et al., 2017; 2018; Mageau & Vallerand, 2003; Haerens et al., 2018). Specifically, autonomy-supportive coaches identify athletes' inner motivational resources by taking the perspective of their athletes and identifying their needs, goals, priorities and preferences. Therefore, an autonomy-supportive coach asks questions, leaves space for athlete input, choice and initiative. Doing this allows coaches to create a sport environment that is attuned to athletes' existing motivational resources, and hence to what triggers athletes' autonomous engagement.

Further, when requesting athletes to engage in an uninteresting and tedious exercise or when introducing a guideline, autonomy-supportive coaches provide an athlete-centered rationale to explain why the activity is worthwhile. In doing so, a coach can build on athletes' inner motivational resources, of which some are unknown or untapped by the athletes. Finally, an autonomy-supportive coach allows and is willing to go along with athletes' resistance and irritation vis-à-vis requests, rules and limitations. By acknowledging the athletes' perspective and the encountered obstacle, the coach lets his or her athletes to feel better understood. Also, such improved understanding of the athlete's point of view would allow the coach to restructure the activity, thereby activating athletes' inner resources or make athletes more aware of the personal value or usefulness of the activity at hand.

Multiple empirical studies have linked autonomy-support to athletes' need satisfaction (e.g., Adie, Duda, & Ntoumanis, 2012; Conroy & Coatsworth, 2007; Haerens et al., 2018; Rocchi, Pelletier, & Couture, 2013) but also to their quality of motivation (e.g., Amorose & Anderson-Butcher, 2007; Haerens, et al., 2018; Reynolds & McDonough, 2015), enjoyment (e.g., Quested et al., 2013), perseverance (e.g., De Muynck et al., 2017; Pelletier et al., 2001), and well-being (e.g., Adie et al., 2012; Gagné, Ryan, & Bargmann, 2003).

The controlling coaching style has long been dealt with as the need-thwarting counterpart of autonomy support (e.g., Reinboth, Duda, &

Ntoumanis, 2004). However, analogous to the distinction between need satisfaction and need frustration, it has been acknowledged that control involves much more than the mere absence of autonomy support (Bartholomew, et al., 2011; Haerens et al., 2015). Control refers to a set of coaching behaviors aimed at pressuring athletes to think, feel, and behave in a coach-prescribed way (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009; 2010; Reeve, 2009).

Instead of attuning the sport environment to athletes' inner motivational resources (cf. autonomy support), a controlling coach actively bypasses and interferes with athletes' preferences by making use of a variety of external and/or internal pressuring practices. Specifically, controlling coaches make use of contingent rewards, threaten with punishment or even rely on physical power and intimidation to control athletes' behavior. More covert controlling tactics involve the use of contingent regard, guilt-induction, or activation of ego-involvement such that athletes experience their coaches' approval to be contingent upon meeting coach-prescribed expectations. Thus, controlling coaches install a sport environment in which failing to behave or perform in a certain way implicates a significant threat to either the coach-athlete relationship or athletes' self-esteem (Mageau & Vallerand, 2003; Ryan, 1982). Controlling coach behaviors prevent athletes from acting volitionally, thereby forestalling autonomous sport motivation. Instead, athletes experience external or internal pressure to behave in line with the 'behavioral corset' created by the coach.

Controlling coaching has been found to be uniquely predictive of athletes' need frustration (Bartholomew et al., 2010; Haerens et al., 2018), low quality motivation (i.e. controlled motivation), and even a lack of motivation (i.e. amotivation) (Pelletier et al., 2001; Haerens et al., 2018), burn-out (Balaguer et al., 2012), and antisocial behavior (Hodge & Lonsdale, 2011).

In line with the idea that autonomy support and control are not opposites on the same continuum, literature in SDT recently argued for the existence of both a "bright and dark pathway" of human motivation

(Bartholomew et al., 2010; 2011; Haerens et al., 2015; 2016). That is, a bright path with autonomy support being supportive of athletes' needs and thus of athletes' thriving. Contrary, control initiates a dark path, specifically by thwarting athletes' needs, resulting in athlete need frustration and in turn a maladaptive pattern of outcomes occurs.

Structure and chaos. A highly autonomy-supportive sport environment can allow athletes a bottom-up voice and choice, which may seem at odds with the provision of top-down structure (i.e., from coach to athlete) which is needed to develop athletes' skills and competence (e.g., Black & Weiss, 1992; Curran, Hill, & Niemiec, 2013). Structure refers to the set of coaching behaviors aimed at fostering athletes' sense of effectiveness and mastery by adopting a process-oriented attitude, hence, predominantly supporting athletes' need for competence. That is, coach structure aims to help athletes to develop a sense of control over desired outcomes (Curran et al., 2013; Soenens & Vansteenkiste, 2010).

Specifically, structuring coaches communicate clear expectations and directions for desirable behavior, provide athlete-desired guidance, provide an overview of practice activities, give informational constructive feedback and monitor both athlete progress and adherence to rules and limitations (Curran et al., 2013; Fransen, Boen, Vansteenkiste, Mertens, & Vande Broek, 2018). Said differently, when high on structure, coaches provide athletes with clear information, expectations and concrete strategies to effectively achieve desired outcomes (Jang et al., 2010; Skinner & Belmont, 1993; Skinner, Johnson & Snyder, 2005). As a result, athletes get to know what is expected and what it takes to develop their competence. Empirical evidence on the role of structuring coaching behaviors is still in its infancy, but clearly shows that athletes benefit from structure in terms of competence, behavioral engagement, and well-being (Black & Weiss, 1992; Carpentier & Mageau, 2013; Curran et al., 2013).

Recent empirical evidence points out that both autonomy-supportive and structuring practices are (sometimes strongly) positively correlated (Aelterman et al., 2018) and when applied in tandem, they in fact appeared to be the best "motivating cocktail" (Carpentier, & Mageau, 2013; Curran et al., 2013; De Muynck et al., 2017). Specifically, athletes' have shown to report more self-determined motivation, need satisfaction, higher well-being and self-esteem, and less negative affect and amotivation when coaches' feedback was combined with autonomy-supportive behaviors. Moreover, these associations were evident above and beyond the provision of autonomy support only and the amount of feedback that was provided (Carpentier & Mageau, 2013). Further, soccer players' perception of structure as provided by their coach positively related to athletes' need satisfaction and in turn to athletes' engagement. Interestingly, perceived coach autonomy support moderated this relations in such a way that positive effect was only evident when accompanied by high autonomy support (Curran, et al., 2013). Finally, in an experimental study with tennis players, it appeared that when players were provided with performance feedback in an autonomy-supportive way, they reported more enjoyment and showed more perseverance, than when performance feedback was delivered in a more controlling manner (De Muynck et al., 2017).

Consistent with the notion that control is more than low autonomy support, also *chaotic coaching behaviors* are more than simply the absence of structure. Moreover, chaos refers to a set of behaviors that are inconsistent, unpredictable, unreliable, and arbitrary. Chaotic coaching behaviors actively interfere with or obscure the pathways towards the achievement of desired athlete outcomes. Chaotic coaching creates a sport environment perceived by athletes as not only poorly structured but also unpredictable, lacking the necessary cues and contingencies for competence development. Concerning to rules and limitations, chaotic behaviors are often referred to as permissive and laissez-faire, lacking the necessary guidance for athlete behavior (Mageau & Vallerand, 2003; Skinner & Belmont, 1993; Skinner et al., 2005). Although

conceptualized as clearly distinct from structure, the notion that chaos represents a separate coaching style that comes with its own costs has been mostly neglected in sport literature. Hence, empirical evidence on the role that chaotic coaching behaviors play in the sport context is scarce. In education, chaotic practices have been associated with more controlled motivation, amotivation and even oppositional defiance and less persistence (e.g., Aelterman et al., 2018).

Warmth and cold. A third collection of need-supportive behaviors is referred to as the *provision of warmth,* and is mainly supportive of athletes' need for relatedness. These behaviors include the expression of affection, kindness and unconditional regard toward the athletes. Warm coaches communicate appreciation of their athletes as an individual, and are emotionally available, supportive, and genuine (Rocchi, Pelletier, Cheung, Baxter, & Beaudry, 2017; Skinner et al., 2005). These warm coaching behaviors create an environment that is considered as psychologically safe and caring (Rocchi, Pelletier, & Desmarais, 2016; Williams, Whipp, Jackson, & Dimmock, 2013).

Contrary, *cold coaching behaviors* that can include rejection and neglect are considered to thwart the need for relatedness. Rejecting coaches display aversion, hostility, harshness, and irritability. They communicate criticism and disapproval towards athletes. Neglecting coaches are distant, do not connect emotionally with and are not available to their athlete when needed (Rocchi et al., 2017; Sheldon & Filak, 2008; Skinner et al., 2005). Cold coaching behaviors are not equal to the mere absence of warmth provision. Both warm and cold coaching behaviors have been found to relate uniquely to athlete outcomes. For instance, positive associations were found between warm coaching behaviors and athletes' need satisfaction, intrinsic motivation, autonomous motivation, positive affect, enjoyment and commitment, emotional self-regulation and psychological well-being (DeFreese & Smith, 2014; Felton & Jowett, 2013; Fry & Gano-Overway, 2010; Fry et al., 2012;

Rocchi et al., 2016). Cold coaching, on the other hand, has been associated with athletes' need frustration, controlled motivation, amotivation and less sport commitment (Pulido, Sánchez-Oliva, Sánchez-Miguel, Amado, & García-Calvo, 2018; Rocchi et al., 2016).

2.3. Advancing the Current Literature on Need-supportive and Need-thwarting Coaching

Although the empirical research on coaches' need-supportive and need-thwarting coaching style has bourgeoned (e.g., Adie et al., 2012; Amorose & Anderson-Butcher, 2007; Bartholomew et al., 2010; Mageau & Vallerand, 2003), at least three issues deserve further investigation and will be addressed in the present dissertation. First, recent literature on coaching behaviors supports the notion that need-support and need-thwarting are not opposites but rather distinct motivating styles (Bartholomew et al., 2010; Haerens et al., 2015). Also, it has been found that coaches may have both sets of coaching behaviors to their disposal (e.g., Haerens et al., 2018). Together this may suggest that a coach can rely on one particular style in a specific competitive situation, whereas rely more on the other in the next competitive situation. In other words, the same coach can vary in deploying need-supportive and need-thwarting behaviors from game to game in order to deal with the complex and dynamic nature of sport competition. Such game-to-game variation in coaching behaviors and its effect on athletes' outcomes has not received adequate attention yet, especially in sport context (but see Tsai, Kunter, Lüdtke, Trautwein, & Ryan, 2008 in education). In fact, most research in the sports domain used an interpersonal difference perspective on coaching behaviors (e.g., Adie, Duda, & Ntoumanis, 2010; Mageau & Vallerand, 2003), not accounting for the dynamic intrapersonal variation in coaching behaviors. The current dissertation aims to take the literature further by investigating possible intrapersonal variation in coaching behaviors and a such do more justice to the complexity of sport coaching.

Second, the merits of need support and the hazards of need thwarting for athletes have been demonstrated by empirical research in many different sport contexts and situations (e.g., a practice session, a competitive game; or in providing feedback, developing skills etc.). However, no research in sports has dug into the question whether athletes' perception of coaching behaviors may also be shaped by the situational circumstances in which they are conveyed. Such a question is related to the concept of *functional significance* in Self-Determination Theory (Ryan & Deci, 2017). Functional significance refers to the meaning athletes attribute to the external events (e.g., coaching behaviors) they are exposed to. On average, the coaching behaviors of the need-supportive style are perceived by athletes as supportive of their needs. Contrary, the behaviors in the need-thwarting category are perceived, on average, as thwarting athletes' needs. In other words, coaching behaviors are not need-supportive or need-thwarting per se, but the supportive and thwarting character of the behavior may be a function of athletes' *perception*. Hence, athletes' attributed meaning (cf. functional significance) of coaching behaviors may get influenced (i.e., qualified) by the situational circumstance at hand, and by personal characteristics of the athlete (Ryan & Deci, 2017). For instance, athletes may experience the need-thwarting response of their coach very differently when they misbehave during practice, compared to when they have difficulties to master certain skills. Furthermore, athletes who are motivated by internal or external pressures (i.e., controlled motivated) might be more engaged in practice when their coach specifically capitalizes on these pressures. Or else, these athletes may also be especially more sensitive for need-thwarting behaviors and hence experience them as especially harmful. The current dissertation aims to provide such a differentiated view on need-supportive and need-thwarting coaching styles that may allow for a better understanding of coaches' motivating styles in interaction with the situational context.

Third, as noted above, research suggests that coach autonomy support and control represent relative distinct styles and cannot be considered as

completely oppositional (Bartholomew et al., 2011). However, whether coach structure and coach chaos are also relatively distinct dimensions and how both are related to autonomy support and control has received less attention. In fact, to the best of our knowledge, no single study within the SDT literature on sport coaching has investigated how autonomy-supportive, controlling, structuring, and chaotic coaching styles, when considered simultaneously, relate to each other. Furthermore, it is not clear how the specific need-supportive and need-thwarting coaching *behaviors* relate to each other, both *within* the same and *across* different categories of coaching styles. The current dissertation aims to provide such a macro-view on need-supportive and need-thwarting coaching styles and the specific behaviors that these styles consist of. Looking at the broader picture may shed light on how different coaching styles and behaviors are related to one another and to athlete outcomes.

3. Objectives of The Current Dissertation

The main objectives of the current dissertation are twofold. As a first objective, the dissertation aims to provide a refined and integrative view on athlete motivation (cf. **Objective 1;** Table 2). Specifically, as argued above, to fully understand athlete motivation one should account for both what athletes are aiming to achieve and why they are aiming for that achievement. In this respect, the current dissertation will *integrate* two dominant motivational frameworks: Achievement Goal Approach (Dweck, 1986; Elliot, 2005; Nicholls, 1984) which typically focuses on what achievement athletes aim for, and Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2017) which informs on the reasons why they are pursuing that achievement. As both theoretical frameworks commonly account for only one aspect of the motivational process, integrating the "what" and "why" will allow us to get a more thorough understanding of athletes' achievement goal striving (cf. **Objective 1.1**). In both **Chapter 2** and **Chapter 3** we investigate the influence of athletes' autonomous and controlled reasons for achievement goal pursuit

on athletes' experience of a competitive event (i.e., long-distance race, soccer game). To complement self-assessed affective and cognitive outcomes in the dissertation, we include in both **Chapter 2** and **Chapter 3** objective and coach rated performance, an athlete outcome which is highly appreciated by both coaches and athletes. In **Chapter 2**, we focus on athletes' intrapersonal achievement goal striving, an achievement goal which is understudied, though very relevant in sports.

Further, through the present dissertation we aim to address the mediating mechanisms through which autonomous and controlled reasons underlying achievement goals influence athletes' experience and performance in a competitive setting. This is an important issue, because knowledge of the mediating processes can *refine* the literature (cf. **Objective 1.2**) and inform field interventions. In **Chapter 2** and **Chapter 3,** we examine both affective (i.e., psychological need experiences) and cognitive (i.e., competition appraisals, self-talk) mediating processes in relation to athletes' achievement goal striving on the one hand, and athletes' emotional (i.e., flow experience) and behavioral (i.e., performance) outcomes on the other hand. Furthermore, in **Chapter 3** we go beyond the common between-athlete perspective and hence, tune in on the game-to-game (within-athlete) dynamics of achievement goal pursuit, to examine the "what" and "why" of achievement goal pursuit in a more precise manner.

The second main objective of the current dissertation is to provide a refined and integrative insight in coaches' motivating style from a perspective of Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2017) (cf. **Objective 2**). The literature on need-supportive and need-thwarting coaching behaviors is ample, yet mostly limited to between-person investigations. Although a few studies in the SDT-tradition did investigate within-person changes in athletes' perception of coaching behaviors throughout one or more competitive seasons, this research lacks real refinement as the level of analysis is mostly contextual and does not reach the situational level of a specific competitive event. In the current dissertation we aim to go further towards

refinement by adopting a *dynamic* game-to-game perspective on athletes' perceived coaching behaviors (cf. **Objective 2.1**). Such dynamic perspective seems vital, because each competitive event has its specific characteristics that may influence coaches' use of certain motivating behaviors, and hence coaches' motivating behaviors may vary between competitive events.

Specifically, in **Chapter 4** we examine the within-person variability in soccer players' perceived need-supportive and need-thwarting coaching behaviors form one game to the next. Further, Chapter 4 investigates the covariation of this game-to-game variation in perceived coaching behaviors with players' moral disengagement and moral behavior towards their opponents, as well as their team mates and the referee. More important, it examines prospectively (before the game) and retrospectively (after the game) how perceived coaching behaviors before and during the game are associated with moral outcomes.

Next, SDT states that perceived need-supportive and need-thwarting coaching behaviors are – in general – associated with beneficial and harmful athlete outcomes, respectively. Empirical research clearly supports this proposition. Nevertheless, contemporary research on coaching behaviors mostly does not address the question whether some variables may influence athletes' perception of coaching behaviors, and hence qualify the motivational impact of such behaviors on athletes. Through the current dissertation we pursue more *differentiation* herein by examining the moderating influence of situational factors and athlete characteristics on the perception of coaching behaviors (cf. **Objective 2.2**).

Specifically, using a vignette-based experimental design, we examine in **Chapter 5** whether the situational circumstances (i.e., athletes are struggling with an exercise vs. athletes are disrupting an exercise) and athletes' characteristics (i.e., type of motivation) shape athletes' perception of coaching behaviors and their motivational (i.e., need satisfaction, need frustration), emotional (i.e., anger) and behavioral (i.e., oppositional defiance, engagement) consequences. Such differentiated perspective is insightful as it

may show that in some cases the effects of coaches' motivating behaviors get exacerbated or diminished, or none of both, which is vital knowledge for any coach that aims to influence athletes' behavior.

Finally, the literature on the effects of need-supportive and need-thwarting coaching styles and specific coaching behaviors is abundant, but also dominated by studies investigating autonomy support and control. The role of structuring and especially chaotic coaching behaviors is mostly neglected in the sports domain. In the present dissertation, we collect autonomy-supportive, controlling, as well as structuring and chaotic coaching practices in one single study to examine their unique effects on athlete outcomes and their relation to one another. As such, the current dissertation aims to provide an *integrative* panoramic view on need-supportive and need-thwarting coaching styles and the coaching practices of which these styles exist. (cf. **Objective 2.3**).

Specifically, by using a more descriptive approach, in **Chapter 6** we examine a) how coaches' autonomy-supportive, structuring, controlling and chaotic motivating styles relate to one another and b) how specific clusters of autonomy-supportive, structuring, controlling and chaotic coaching practices relate to one another and to athlete outcomes. Such a comprehensive examination is useful as it may show that some coaching behaviors have even stronger need-supportive/need-thwarting qualities than others. In other words, through Chapter 6 we aim to provide both *refinement* and *integration* concerning coaches' motivating styles. Table 2 and Figure 3 provide an overview of the main objectives, sub-objectives and the chapters that will serve them.

Table 2: Overview of the chapters and objectives of the present dissertation.

Chapters	Title	Objectives	
1	General introduction		
2	Intrapersonal achievement goals and underlying reasons among long distance runners: Their relation with race experience, self-talk, and running time.	1	1.1 – 1.2
3	On the game-to-game variation in soccer players' reasons underlying task-approach goal pursuit and performance: The role of challenge and threat appraisals.	1	1.1 – 1.2
4	A game-to-game investigation of the relation between need-supportive and need-thwarting coaching and moral behavior in soccer.	2	2.1
5	Do athletes' responses to coach autonomy support and control depend on the situation and athletes' personal motivation?	2	2.2
6	Adopting a helicopter-perspective towards motivating and demotivating coaching: A circumplex approach.	2	2.2 – 2.3
7	General discussion		
Objective 1	Towards a more refined and integrative insight in athletes' motivation		
Objective 1.1	Integrating the "what" and "why" of athlete motivation		
Objective 1.2.	Investigating the mediating mechanism between the "what" and "why" and athlete outcomes		
Objective 2	Towards a more refined and integrative insight in coaches' motivating style		
Objective 2.1	Towards a more dynamic view on coaching behavior		
Objective 2.2	Towards a more differentiated view on coaching behavior		
Objective 2.3	Towards a more integrated view on coaching behavior.		

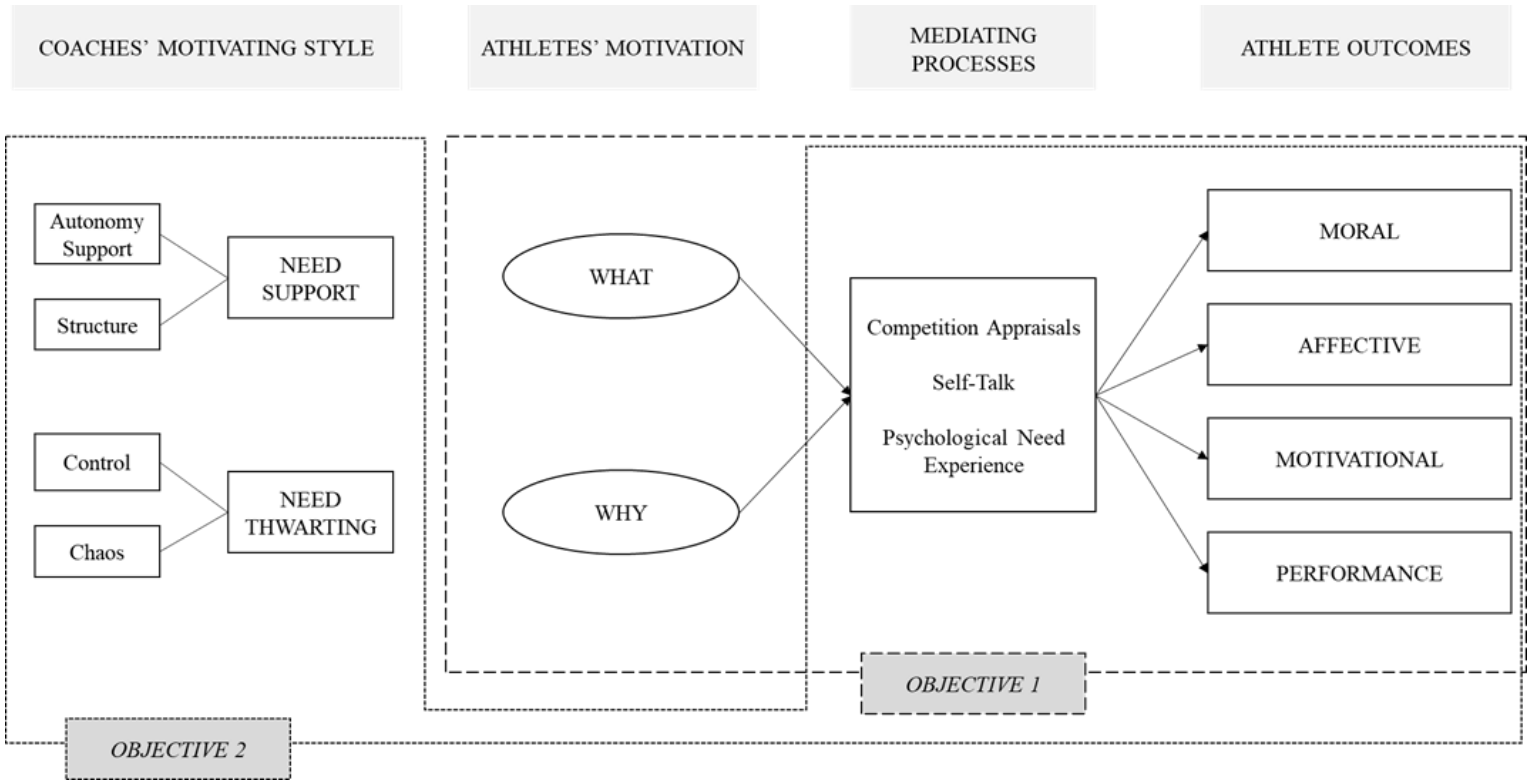

Figure 3: Graphical overview of the main objectives of the present dissertation.

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Chapter 2

Intrapersonal Achievement Goals and Underlying Reasons among Long Distance Runners: Their Relation with Race Experience, Self-Talk, and Running Time[1]

[1] Delrue, J., Mouratidis, A., Haerens, L., De Muynck, G-J., Aelterman, N., & Vansteenkiste , M. (2016). Intrapersonal Achievement Goals and Underlying Reasons among Long Distance Runners: Their Relation with Race Experience, Self-Talk, and Running Time. *Psychologica Belgica, 56,* 288-310.

In a sample of long distance runners, we examined the role of type of intrapersonal achievement goals (i.e., approach versus avoidance) and type of underlying reasons (i.e., autonomous and controlled), assessed prior to the race, as predictors of both pre-race (e.g., race appraisals) and post-race (e.g., flow experience) outcomes. Of 221 (62.4% males) runners, 111 reported pursuing an intrapersonal-approach goal (i.e., doing better than before) as their dominant or preferred achievement goal for the race, while 86 prioritized intrapersonal-avoidance goals (i.e., avoiding to perform worse than before). Regression and path analyses showed that the type of achievement goals predicted none of the outcomes except for running time, with approach goals predicting better performance when compared to avoidance goals. Path analyses revealed that autonomous reasons underlying intrapersonal goal pursuit related positively to pre-race challenge appraisals, performance and, via need satisfaction, to flow experience. Interestingly, controlled reasons positively related to pre-race threat appraisals and positively predicted both positive and negative self-talk, with both yielding opposing relations with flow. These findings complement past research on the intersection between the Achievement Goal Approach and Self-Determination Theory and highlight the value of studying the reasons underlying intrapersonal achievement goals.

Introduction

Distance running has become a popular recreational sport activity, as illustrated by the increasing participation rates in races like the Marathon of New York and the 20 kilometers of Brussels (Scheerder, Breedveld, & Borgers, 2015). One critical factor to understand runners' running experience is their motivation for participating in a race and for aspiring certain achievement goals. We relied on Self-determination Theory (SDT: Deci & Ryan, 2000) and the Achievement Goal Approach (AGA: Elliot, 2005) and sought to understand whether the motivational experiences of runners of a popular street race, the "20 km of Brussels", would relate to their race-appraisals, race experiences, and their actual performance. We focused on runners' intrapersonal achievement goals (Elliot, Murayama, & Pekrun, 2011), that is, the type of goals that athletes set for themselves in relation to their previous performance, because such goals are highly salient among long distance runners and remain understudied in the sports context.

Specifically, we examined whether runners' race appraisals, flow and performance would vary as a function of the type of pre-race intrapersonal goal runners set (i.e., approaching success versus avoiding failure) and the reasons for pursuing the goal (i.e., autonomous versus controlled). Further, we considered two different mechanisms, that is, psychological need satisfaction and self-talk, as potential explanatory processes of the hypothesized relation between pre-race goals and underlying reasons on the one hand and flow and performance on the other (see Figure 1). The satisfaction of the psychological needs for autonomy and competence is critical for full task absorption (Kowal & Fortier, 1999), which is conducive to a flow experience. Yet, apart from this more affective mechanism, we also considered the role of self-talk, a more cognitive-oriented process, as it denotes "athletes' verbalizations to themselves" (Hardy, Hall, & Hardy, 2005). We reasoned that athletes' self-talk may represent a critical motivational vehicle through which runners'

achievement goals and their underlying reasons may relate to their race experience and racing time.

Figure 1: Theoretical proposed model

Intrapersonal Goals: An Understudied Type of Achievement Goals

Over the past two decades, AGA (Elliot, 2005; Senko, Hulleman, & Harackiewicz, 2011) has been the guiding framework in dozens of studies in the sports literature (e.g., Adie, Duda, & Ntoumanis, 2008; Nicholls, Perry, & Calmeiro, 2014). Goals are "concrete cognitive representations that serve a directional function in motivation by guiding the individual toward or away from a specific possible outcome" (Elliot & Thrash, 2001 p. 143). A goal thus refers to a particular aim or end result one tries to approach or avoid. Within the AGA, six different achievement goals have been discerned depending on how competence and the associated success are defined and valenced.

Three achievement goals have been distinguished as a function of whether competence is defined depending on a) a task-based or absolute standard, b) an intrapersonal or self-based standard, and c) an interpersonal or normative standard (Elliot et al., 2011). With respect to the *valence* dimension, the competence standard can be evaluated positively in which case individuals approach an achievement situation to attain success, or it can be evaluated negatively, in which case individuals are focused on avoiding incompetence or failure (e.g., Elliot et al., 2011). By crossing the dimensions of definition and valence, a taxonomy consisting of six different achievement goals is obtained. To illustrate, athletes adopt a task-approach goal when they are

focused on mastering the requirements of the task and a task-avoidance goal when they want to avoid falling short of such requirements. Instead, when athletes aim to do better or avoiding doing worse compared to their former performances on a similar task, they are said to hold, respectively, an intrapersonal-approach and an intrapersonal-avoidance goal. Finally, when athletes aim to do well in comparison with others or aim to avoid performing worse than others, they are said to endorse an interpersonal-approach and an interpersonal-avoidance goal, respectively.

The number of achievement goals scholars have studied has varied depending on their research questions, interests, and preferences. In sports contexts, most research has examined the correlates of task-based and interpersonal goals. In general, a host of primarily cross-sectional studies have shown that task-approach goals are positively related to challenge appraisals (e.g., Adie et al., 2008; Nicholls et al., 2014), positive self-talk (Zourbanos, Pappaioannou, Argyropolou, & Hatzigeorgiadis, 2014), enjoyment (e.g., Morris & Kavussanu, 2009), and performance (e.g., Van Yperen, Blaga, & Postmes, 2014), while being negatively related to threat appraisals (e.g., Adie et al., 2008), negative self-talk (Zourbanos et al., 2014), cognitive anxiety (Morris & Kavussanu, 2009), and self-handicapping (e.g., Chen, Wu, Kee, Lin, & Shui, 2009). Task-avoidance goals, on the contrary, were found to relate positively to threat appraisals (Adie et al., 2008; Nicholls et al., 2014), cognitive anxiety (Morris & Kavussanu, 2009), and self-handicapping (Chen et al., 2009). Similar to task-approach goals, interpersonal-approach goals have been found to relate positively to performance (Van Yperen et al., 2014), challenge (Adie et al., 2008), as well as threat appraisals (Adie et al., 2008) and negatively to self-handicapping (Chen et al., 2009). Contrary to their approach oriented counterparts, interpersonal-avoidance goals are positively related to self-handicapping (e.g., Chen et al., 2009), cognitive anxiety (Morris & Kavussanu, 2009) and threat appraisals, but negatively to challenge appraisals (Adie et al., 2008).

To date, intrapersonal goals have received far less attention within the AGA framework, presumably because they were only fairly recently conceptually and empirically differentiated from task-based goals (Elliot et al., 2011). This is unfortunate because intrapersonal goals may be heavily prominent among athletes and carry a high ecological validity. Indeed, for most athletes, improving their skills or performance is a primary goal and a key factor that influences their motivational functioning (see Martin, 2006; Harwood, Hardy, & Swain, 2000). To fill this void, we investigate herein whether athletes participating in a long distance running race would favor intrapersonal over interpersonal goals. In addition, we examined whether the type of *dominant* or *preferred* achievement goal (Van Yperen, 2006) of runners would relate to pre-race appraisals and expected running time, and during the race itself to self-talk, need satisfaction, flow experience, and finally actual running performance.

A few previous studies have examined the correlates of intrapersonal goals outside the sports domain. In an initial examination, Van Yperen (2006) found that two thirds of the learners favored intrapersonal above interpersonal achievement goals, with intrapersonal-approach goals being the most frequently selected. Further, learners with a dominant intrapersonal-avoidance goal scored lowest on intrinsic motivation and self-efficacy compared to most of the other achievement goal profiles. In a subsequent experimental study, Van Yperen, Elliot and Anseel (2009) showed that the activation of an intrapersonal-avoidance goal, relative to an intrapersonal-approach goal, results in lower levels of performance improvement. More recently, Elliot et al. (2011) reported that, when controlling for the shared variance between all six identified achievement goals, intrapersonal-approach and intrapersonal-avoidance goals yielded, respectively, a unique positive and a unique negative relation to learners' energy, but both were unrelated to intrinsic motivation.

Although not directly grounded in the AGA, Martin's (2006) work on personal best goals, which he defined as "personalized goals or standards of excellence that match or exceed one's previous best" (Martin & Liem, 2010;

p. 264), is worth being mentioned because of its resemblance with intrapersonal-approach goals. Similar to intrapersonal approach goals, personal best goals appear quite adaptive as they relate positively to enjoyment, class participation, persistence, and achievement among learners.

Overall then, intrapersonal goals have received far less attention within the AGA and were almost exclusively studied among learners (but see Van Yperen, Hamstra, & Van Der Klauw, 2011). This leaves the question unanswered whether these goals, relative to interpersonal goals, would yield different affective and cognitive outcomes among athletes. Specifically, flow and actual performance constitute the critical outcomes in the current study. Flow refers to an optimal psychological state in which a person is totally immersed in an activity and has positive experiences like freedom of self-consciousness and enjoyment of the process (Jackson & Marsh, 1996). With regard to performance, running time constitutes an important outcome in a running race. Besides, we were also interested whether the intrapersonal goals would relate to how runners appraise the upcoming race (i.e., as a challenge or a threat).

Not All Intra-Personal Goals Are Equally Motivated: Examining their Underlying Reasons

Apart from the gradual extension of the number of studied achievement goals, another important evolution within the field concerns the revision of the achievement goal concept as such (Vansteenkiste, Lens, Elliot, Soenens, & Mouratidis, 2014). Specifically, Elliot and Thrash (2001) maintained that achievement goals should be exclusively defined based on the type of pursued standard, whereas all other aspects, including feelings, reasons, and attributions, should be removed from the achievement goals definition as they represent peripheral rather than central features. This reconceptualization represented an important departure from the initial conceptualization of achievement goals (Nicholls, 1984; Dweck, 1986)

according to which achievement goals had been conceptually interwoven with specific underlying reasons. For instance, the pursuit of interpersonal goals was originally conceived as ego-involved as performance-oriented individuals were supposed to outperform their peers to prove, or boost, their self-worth and value. The separation of the reasons (i.e., "why" of achievement goals) from the type of pursued aims (i.e., "what" of achievement goals) created the possibility to systematically investigate the role of different types of reasons underlying achievement goals (Lens & Vansteenkiste, 2006; Vansteenkiste, Lens et al., 2014). To illustrate, athletes may no longer solely pursue interpersonal goals out of ego-concerns but also to meet external pressures or because they may consider competing with others as an exciting opportunity and challenge (Reeve & Deci, 1996; Vansteenkiste, Mouratidis, & Lens, 2010).

Vansteenkiste, Smeets and colleagues (2010) argued that one framework that is ideally suited to study a diversity of reasons that may drive individuals' achievement goal pursuit is Self-Determination Theory (SDT; Deci & Ryan, 2000). Specifically, athletes can pursue goals because they find them enjoyable, challenging, or personally significant (i.e., autonomous reasons) or because they feel internally or externally pressured to do so (i.e., controlled reasons). An increasing number of mostly cross-sectional studies in diverse domains, including education (e.g., Gaudreau, 2012) and work (e.g., Gillet, Lafrenière, Vallerand, Huart, & Fouquereau, 2014), have examined the unique and interactive contribution of achievement goals and underlying reasons in the prediction of outcomes, and found these reasons to account for substantial and unique variance above and beyond the achievement goals themselves (see Vansteenkiste, Lens et al., 2014 for an overview).

To the best of our knowledge, only three such studies were conducted in the sports context, albeit mostly in team sports. Focusing on the reasons underlying interpersonal goals among amateur soccer players, Vansteenkiste, Mouratidis et al. (2010) found controlled reasons to relate positively to immoral functioning (i.e., aggressive play), whereas autonomous reasons

were positively associated with positive emotional outcomes. Next, in a study among volleyball players, who were followed during multiple consecutive competitive games (Vansteenkiste, Mouratidis, Van Riet, & Lens, 2014), game-to-game variation in the autonomous regulation of task-approach goals related positively to game-to-game variation in affective (e.g., enjoyment, performance satisfaction) and behavioral outcomes (e.g., prosocial behavior). Finally, Gaudreau and Braaten (2016) reported that autonomous reasons underlying both task-approach and interpersonal-approach goals related positively to positive affect and subjective performance among athletes from various sports, whereas controlled reasons were related to less positive and more negative affect. Moreover, reasons and achievement goals interacted such that autonomous reasons amplified the positive association between task-approach goals and desirable outcomes.

Theoretically, the reason why autonomous regulation yields various benefits is because it allows for greater satisfaction of the psychological needs for autonomy (i.e., experiencing a sense of volition), competence (i.e., feeling effective), and relatedness (i.e., experiencing closeness) (Deci & Ryan, 2000). In contrast, a controlled regulation may engender experiences of need frustration (e.g., Haerens, Aelterman, Vansteenkiste, Soenens, & Van Petegem, 2015). Consistent with this argument, Gillet et al. (2014) found psychological need satisfaction to explain the positive contribution of autonomous reasons underlying interpersonal-approach goals to affective outcomes in the goal process.

Present Research

The present study aimed to extend the limited body of work on the "what" and "why" of achievement goals by (a) focusing on an underexamined achievement goal (i.e., intrapersonal goals), (b) sampling athletes participating in an individual instead of a team sport (i.e., runners), (c) adopting a prospective instead of cross-sectional research design in the

prediction of outcomes that are highly appreciated in competitive sports such as flow and performance, (d) including an objective rather than a self-reported performance indicator, and (e) considering the role of both a more affective (i.e., need satisfaction) and a cognitive (i.e., self-talk) explanatory mechanism.

Specifically, we adopted a prospective design, thereby including a host of pre- and post-race variables. The inclusion of both pre- and post-race variables allowed us to examine whether the type of pursued achievement goal (the "what") and its underlying reasons (the "why") would not only relate to how runners appraise the race (i.e., as a challenge or a threat) and what time they set as a target, but also whether these motivational dynamics would carry over into how they eventually come to experience the race and how well they actually perform (Figure 1).

We pursued the following five hypotheses. First, we investigated the prevalence of different types of personal achievement goals among long distance runners. As the participating runners are experienced amateurs, with many of them having a fairly clear view of their personal best time, we hypothesized that most of them would select an intrapersonal goal as their primary or dominant goal for the race (Van Yperen, 2006).

Second, we explored whether runners would display a different pattern of outcomes depending on their selected dominant achievement goal. Because approach goals orient runners to the possibility of success, we expected runners with a dominant approach goal, either intrapersonal or interpersonal, to perceive the race more as a challenge, to aspire a sharper time, to experience greater flow and psychological need satisfaction during the race and to run faster compared to runners adopting an avoidance goal.

Third, concerning the "why" of achievement goals we expected that autonomous and controlled reasons underlying intrapersonal goals would explain additional variance in the outcomes above and beyond the variance explained by the "what" of achievement goals. Specifically, we hypothesized autonomous reasons to relate to a positive pattern of outcomes involving greater challenge appraisal, need satisfaction, and flow experience as well as

better performance. In contrast, controlled reasons would relate to a more negative pattern of outcomes involving greater threat appraisals, more negative self-talk, less need satisfaction, and less flow.

Fourth, we examined whether the "what" and "why" of intrapersonal goals would interact in the prediction of outcomes. While Gaudreau (2012) reported fairly systematic evidence for such interactions in the case of both task-approach and interpersonel-approach goals, other studies provided only partial (Benita, Roth, & Deci, 2014; Gaudreau & Braaten, 2016; Gillet et al., 2014) or no evidence at all for such interactions (Vansteenkiste et al., 2010). It is possible though that the reasons underlying intrapersonal goals alter the perceived meaning of the achievement goals themselves, such that the effects of goal-contents vary as a function of these reasons. Alternatively, reasons may exacerbate the hypothesized effects of particular goal-contents, such that, for instance, particular goal-contents (e.g., avoidance goals) may in combination with particular reasons (e.g., controlled) yield a surplus effect not accounted for by the two main effects.

Fifth, as depicted in our theoretical Figure 1, we explored whether runners' self-talk and experienced need satisfaction during the race can help to explain the effects of the "what" and "why" of achievement goals on flow experience and performance. Whereas need satisfaction, as a more affective process, has received considerable prior attention in the SDT-literature (e.g., Chen, Vansteenkiste, Beyers, Soenens, & Van Petegem, 2013), self-talk, as a more cognitive mechanism, has not been explored. We reasoned that self-talk represents a mental tool (Schüler & Langens, 2007; Blanchfield, Hardy, Morree, Staiano, & Marcora, 2014) to regulate ongoing behavior and affective experiences in a goal striving context, thereby allowing one to either boost or undermine experiences of flow and performance. Self-talk has been found to promote greater attention and performance (e.g., Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2009; Van Raalte et al., 1995), to help marathon runners counter a "psychological crisis" during the race (Schüler & Langens, 2007), and can be predicted by one's pursued achievement goals (e.g.,

Zourbanos et al., 2014). We hypothesized that the pursuit of intrapersonal-avoidance goals, relative to intrapersonal-approach goals, and the controlled regulation of the goals would go together with more negative self-talk due to the pressure and anxiety associated with avoidance goals and its controlled regulation (see Oliver, Hardy, & Petherick, 2008). We were more ambivalent with respect to the effects of autonomous reasons, as autonomously motivated runners are more likely to get fully immersed in the race (Kowal & Fortier 1999), thereby leading them to experience greater need satisfaction and flow without necessarily prompting them to engage in any self-talk at all. On the other hand, to the extent they are engaged in self-talk, such self-talk may be rather positive, which in turn would associate with more flow experience.

Method

Participants and Procedures

We recruited participants through two different channels. First, we contacted two Flemish non-governmental organizations (NGO), which encourage their members to take part in the 20 kilometers of Brussels, to participate in the present study. To promote the study amongst the members of these two organizations, a flyer was composed with basic information regarding the purpose of the study and a link to an online questionnaire. This flyer was distributed to individuals who had subscribed for the race through the NGO one week before the race. Second, during the week before the race, the study was promoted on the social medium of the race organization. As such, participants were able to get access to the online questionnaire. All the participants filled in the pre-race questionnaire between one and six days before the race. During this first assessment, 246 (63.4% males) participants (236 Belgians, 4 Dutch, 1 Belgian-Portuguese, 1 Italian, Portugese, Polish, Spanish, and Jamaican) were asked to provide their e-mail address through which we invited them to fill in the post-race assessment. One day following

the street race, all participants got an inviting e-mail, of whom 180 completed the post-race assessment (81.4% retention), at the latest seven days after the race. Only one participant completed the post-race questionnaire nine days later.

Measures

Pre-race assessment.

Dominant achievement goal. Runners' dominant or preferred achievement goal (Van Yperen, 2006) was assessed via a rank order method (see Vansteenkiste, Mouratidis et al., 2014). Having read the stem "In the upcoming race I find it most important…", the participants were asked to rank order the following four achievement goals: "… to do better than others" (interpersonal-approach goal), "… not to do worse than others" (interpersonal-avoidance goal), "… to do better than before" (intrapersonal-approach goal) and "… not to do worse than before" (intrapersonal-avoidance goal). The goal that was ranked first was considered the runners' dominant achievement goal.

Reasons underlying the dominant achievement goal. Once runners had identified their dominant achievement goal for the upcoming race, they were given a set of items that tapped into the autonomous and controlled reasons for pursuing their self-identified dominant achievement goal (Vansteenkiste, Mouratidis et al., 2014). After the stem "For the upcoming race I aim to pursue the goal I have ranked first because…", there were sixteen items purporting to probe four different regulations, namely external regulation (e.g., "…others would appreciate me"; α = .80), introjected regulation (e.g., "…I would feel guilty if I would not"; α = .72), identified regulation (e.g., "…I totally agree with this goal"; α = .71), and intrinsic motivation (e.g., "…I find it a challenge to aim for this goal"; α = .75). A five-point Likert-type scale was used anchored from 1 (*I totally disagree*) to 5 (*I totally agree*). Scores for controlled and autonomous reasons were computed

by averaging, respectively the external and introjected regulation items (α = .84) and identified and intrinsic regulation items (α = .82). The creation of these two composite scores was also empirically justified as a principal component analysis provided evidence for the extraction of two distinct factors representing autonomous (λ = 3.14) and controlled motives (λ = 4.62), which explained, respectively, 19.61% and 28.85% of the total variance.

Race appraisals. Runners' race appraisals were assessed via the *Challenge and Threat Construal Questionnaire* (McGregor & Elliot, 2002), which was translated and adapted for the purposes of the current study. This instrument consisted of five items probing the perception of challenge (e.g., "I view the upcoming race as a challenge"; α = .65) and of five items asking for the perception of threat (e.g., "I am dreading the upcoming race", α = .77). Participants answered on a seven-point Likert-type scale with answers ranging from 1 (*Not at all true of me*) to 7 (*Completely true of me*).

Post-race assessment

Self-talk. Runners' self-talk during the race was assessed via a translated version of the *Automatic Self-Talk Questionnaire for Sports* (ASTQ-S; Zourbanos, Hatzigeorgiadis, Chroni, Theodorakis, & Papaioannou, 2009). This self-talk instrument includes a positive (α = .92) and negative self-talk (α = .88) factor, each consisting of four subscales. The four positive subscales were *psyching up* (5 items; e.g., "Do your best"), a*nxiety control* (4 items; e.g., "Don't get upset"), *confidence* (5 items; e.g., "I feel strong"), and *instruction* (5 items; e.g., "Concentrate"). The four negative scales were *worry* (7 items; e.g., "I am not going to make it"), *disengagement* (5 items; e.g., "I want to stop"), *somatic fatigue* (5 items; e.g., "I am tired"), and *irrelevant thoughts* (4 items; e.g., "what will I do later tonight?"). The five-point Likert scale was answered from 0 (*never*) to 4 (*very often*) to indicate how often runners had such thoughts during the race. A second-order principal component analysis, including the various subscales instead of items, with promax rotation indicated that two factors could best be retained. All four

positive subscales loaded on the first factor (λ = 8.50; explained variance 21.79%), while all negative subscales, but irrelevant thoughts, loaded on the negative factor (λ = 5.99; explained variance 15.37%). Although irrelevant thoughts did not load on any factor, we retained this subcomponent in the computation of the composite score of negative self-talk in light of prior empirical findings and on theoretical grounds.

Psychological need satisfaction. An adapted version of the *Basic Need Satisfaction in Sport Scale* (BNSSS; Ng, Lonsdale & Hodge, 2011) was used to assess runners' autonomy and competence need satisfaction. After the stem "During the race I felt…", there were four items gauging competence need satisfaction (e.g., "I could handle this challenge"; α = .80), and six items measuring autonomy, (e.g., "I was doing what I wanted to do" and "I was participating willingly"; α = .79) All the answers were provided on a seven-point Likert type format from 1 (*Not at all true of me*) to 7 (C*ompletely true of me*).

Flow. Runners were asked for their flow experience via a translated and adapted version of the *Flow State Scale* (FSS; Jackson & Marsh, 1996). As the balance between challenges and skills is considered a precondition rather than a central part of flow (Kawabata & Mallet, 2011), we left out this subscale. The runners indicated to what extent during the race they concentrated on their race (e.g., "My attention was focused entirely on what I was doing; α = .77); felt that their actions were merging with their self (e.g., "things just seemed to happen automatically; α = .67); lost self-consciousness (e.g., "I was not concerned with how I was presenting myself" ; α = .68); had sense of control, without actively trying to exert control (e.g., "I felt like I could control what I was doing"; α = .83); experienced transformation of time (e.g., "The way time passed seemed to be different from normal"; α = .74); and had autotelic experiences (e.g., "I found the experience extremely rewarding"; α = .88).

All the answers for the six four-item subscales were provided on a seven-point Likert type format ranging from 1 (*I totally disagree*) to 7 (*I totally agree*). An average score from the six subscales was computed and used as an index of athletes' flow experiences ($\alpha = .84$).

Results

Preliminary analyses

After inspection of the data, several missing values in certain outcomes were found. For instance, among the 246 athletes who completed the pre-race assessment 24 (9.8%) failed to finish the 20 km run and, as a result, we had no information regarding their performance. Likewise, we had 22 (10.2%) missing values for the dominant goal, 35 (14.2%) missing values for challenge and threat, 62 (25.2%) for positive and negative self-talk, and 70 (28.5%) for flow experience. Although a missing data test with expectation maximization algorithm was statistically nonsignificant (Little's MCARC test $\chi^2(57) = 58.06$, $p = 44$, *ns*.) suggesting that missing values were most likely missing at random, we opted for listwise deletion for each set of analyses that we performed.

Independent sample *t*-tests with the available data indicated that males appraised the race as less threatening ($M = 1.93$; $SD = 0.91$; $t(209) = -2.88$, $p < .01$), were more ambitious ($M = 105.19$; $SD = 16.61$; $t(150.877) = -7.39$, $p < .001$), and ran faster ($M = 106.30$; $SD = 23.11$; $t(208) = -7.36$, $p < .001$) compared to females ($M = 2.31$; $SD = 0.96$; $M = 124.55$; $SD = 20.39$; $M = 129.74$; $SD = 19.12$). Therefore, we decided to control for gender in all regressions and path-analyses. Further, age related negatively to controlled reasons ($r = -.24$, $p < .01$), challenge ($r = -.28$, $p < .01$) and threat appraisal ($r = -.34$, $p < .01$) before the race and to negative self-talk ($r = -.19$, $p < .001$) during the race. By consequence we controlled for age as well. The bivariate correlations among the measured constructs are reported in Table 1.

Hypothesis 1: Prevalence of Dominant Achievement Goals

Only few athletes ranked as most important either interpersonal-approach (N = 11; 5.0%) or interpersonal-avoidance goals (N = 13; 5.9%). The large majority of them reported either intrapersonal-approach (N = 111; 50,2%) or intra-personal avoidance goals (N = 86; 38.9%) as their dominant goal. A chi-square test examining the distribution of the dominant goal frequencies was significant, $\chi^2(3) = 141.12$, $p < .01$. As such, the participants were not equally distributed over the goals. In particular, the respective odds to report intrapersonal-approach goals over interpersonal-approach and interpersonal-avoidance goals were, respectively, 19.3 and 16.1 times higher. Likewise, the odds for an athlete to select intrapersonal-avoidance goals over the interpersonal-approach and interpersonal-avoidance goals were, respectively, 12.2 and 10.2 times higher. Finally, as for the intrapersonal goals themselves, the odds for an athlete to report intrapersonal-approach goal over intrapersonal-avoidance goal as a dominant goal was 1.58 times higher. Taken together, these results suggest that intrapersonal-approach goals were most salient, followed by intrapersonal-avoidance goals and interpersonal goals.

Table 1: Bivariate correlations of the measured variables of the study among all participants.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
Background variables													
1. Gender	-												
2. Age	-.13*	-											
Pre-race measures													
3. Autonomous reasons	.01	-.08	-										
4. Controlled reasons	.01	-.24**	.25**	-									
5. Challenge appraisal	.11	-.28**	.45**	.25**	-								
6. Threat appraisal	.20**	-.34**	.06	.43**	.10	-							
7. Aspired performance	.48**	.11	-.22**	-.14*	.07	.12	-						
Post-race measures													
8. Positive self-talk	-.13	.01	.19**	.30**	.26**	.16*	.01	-					
9. Negative self-talk	.04	-.19*	.11	.30**	.01	.29**	.04	.23**	-				
10. Autonomy satisfaction	-.05	.07	.39**	-.06	.28**	-.24**	.08	.18*	-.25**	-			
11. Competence satisfaction	-.11	-.07	.33**	.14	.39**	-.14	-.25**	.28**	-.22**	.49**	-		
12. Flow	-.04	-.01	.18*	.08	.28**	-.05	.02	.26**	-.34**	.34**	.44**	-	
13. Actual performance	.47**	.11	-.20**	-.07	.03	.14	.91**	.03	.14	.09	-.25**	.00	-

Note. * $p < .05$. ** $p < .01$.

Hypothesis 2: Differences between Dominant Goal Profiles

Next, we examined whether the athletes differed in any of the pre-race or post-race outcomes as a function of their dominant goal endorsement. To avoid extensive listwise deletion due to missing cases in athletes' post-race self-reports, we performed two sets of multivariate analysis of variance (MANOVA), one involving the pre-race measures (i.e., challenge, threat, autonomous and controlled reasons underlying dominant achievement goal and athlete's aspired time) and one containing the post-race measures (i.e., positive and negative self-talk, need satisfaction, flow, and actual performance). Both sets of dependent variables were analyzed as a function of the dimensions of competence definition (i.e., intrapersonal vs. interpersonal) and valence (i.e., approach vs. avoidance) and their interaction. Regarding the pre-race assessment variables, there was a main effect for competence valence, Wilk's $\Lambda = .941$, $F(5, 198) = 2.48$, $p < .05$, partial $\eta^2 = .06$, but not for competence definition, Wilk's $\Lambda = .955$, $F(5, 198) = 1.86$, $p = .10$, nor for the competence valence by definition interaction, Wilk's $\Lambda = .979$, $F(5, 198) = 0.83$, $p = .53$. The follow-up ANOVAs for the competence valence dimension (controlling for inflated type I errors according to the Bonferroni procedure) showed statistically significant differences in aspired performance time only ($F(1, 202) = 10.29$, $p < .01$, partial $\eta^2 = .05$). In particular, athletes who endorsed an approach goal aspired to run faster ($M = 105.83$ minutes; $SD = 2.97$) when compared with their counterparts who endorsed an avoidance goal ($M = 119.41$ minutes; $SD = 3.02$).

Regarding the post-race assessment variables, there was, again, a main effect for the valence dimension (i.e., approach versus avoidance), Wilk's $\Lambda = .898$, $F(7, 157) = 2.57$, $p < .05$, partial $\eta^2 = .10$, but not for the competence definition, Wilk's $\Lambda = .954$, $F(7, 157) = 1.07$, $p = .39$, nor for the definition by valence interaction, Wilk's $\Lambda = .957$, $F(7, 157) = 1.00$, $p = .43$. The follow-up ANOVAs for the valence dimension (after Bonferroni adjustment for inflated type I errors) showed marginally significant

differences in negative self-talk ($F(1, 163) = 6.74$, $p = .01$, partial $\eta^2 = .04$) and actual performance ($F(1, 163) = 5.30$, $p = .02$, partial $\eta^2 = .03$). Inspection of the means revealed that athletes who favored a dominant approach goal reported less negative self-talk ($M = 0.58$; $SD = 0.09$) and performed better ($M = 113.03$ minutes; $SD = 3.83$) than athletes with a dominant avoidance goal ($M = 0.88$; $SD = 0.07$ and $M = 124.63$ minutes; $SD = 3.22$). The means and standard deviations as a function of dominant goal endorsement are shown in Table 2.

Because the reasons underlying the dominant achievement goal were anchored with the self-selected dominant goal and because only a minority of the runners endorsed interpersonal goals, we were forced to drop the interpersonal-oriented athletes when addressing the role of the reasons underlying achievement goals (as was also the case in Vansteenkiste, Mouratidis, et al., 2014).

Table 2: Mean-group comparisons between runners as a function of chosen dominant achievement goal.

Variables	Dominant or Preferred Goal								*F*-statistic
	Intrapersonal-approach goals (*N* = 111; 63.1% males)		Intrapersonal-avoidance goals (*N* = 86; 59.3% males)		Interpersonal-approach goals (*N* = 11; 81.8% males)		Interpersonal-avoidance goals (*N* = 13; 61.5% males)		
Pre-race assessment									
1. Challenge appraisal	5.19	(0.85)	4.93	(0.80)	5.02	(1.15)	5.22	(1.11)	(3, 207) 1.43
2. Threat appraisal	2.00	(0.84)	2.02	(0.95)	2.22	(1.04)	2.91	(1.39)	(3, 207) 3.37
3. Aspired time	106.67	(17.33)	119.33	(21.50)	105.33	(20.50)	121.83	(15.67)	(3, 211) 8.47*
Post-race assessment									
4. Positive self-talk	1.89	(0.69)	1.76	(0.69)	2.17	(0.48)	2.20	(0.51)	(3, 176) 2.03
5. Negative self-talk	0.67	(0.46)	0.68	(0.40)	0.51	(0.20)	1.06	(0.72)	(3, 176) 3.01
8. Autonomy satisfaction	6.36	(0.71)	6.27	(0.74)	6.62	(0.45)	6.41	(0.76)	(3, 173) 0.62
6. Competence satisfaction	5.49	(0.98)	5.17	(0.93)	5.96	(0.55)	5.36	(1.00)	(3, 173) 2.34
7. Flow	3.42	(0.49)	3.47	(0.44)	3.38	(0.35)	3.47	(0.41)	(3, 168) 0.19
8. Actual performance	109.58	(18.50)	123.42	(23.05)	109.45	(23.23)	125.32	(15.20)	(3, 201) 8.08*

Note. * $p \leq .0038$. Due to Multiple Comparisons, alpha was set at the .0038 level.

Hypothesis 3 and 4: Contribution of the "what" and "why" of intrapersonal goals

Focusing on athletes adopting a dominant intrapersonal goal (N = 197), we examined to what extent goal content (i.e., approach vs. avoidance), the type of reasons underlying its endorsement, and the two-way interactions between goal content and reasons predicted pre-race and post-race outcomes by means of hierarchical regression analyses (see Table 3). The background characteristics of age and gender, along with the goal type (intrapersonal-approach vs. intrapersonal-avoidance) were entered in Step 1, the autonomous and controlled underlying reasons were added in Step 2, while in Step 3 all the two-way interactions were considered. Step 3 is not addressed in Table 3, because only one two-way interaction reached significance.

Concerning the pre-race measures, and in partial support of our hypothesis, intrapersonal-approach goals were positive predictors of challenge and aspired time. When reasons were also added in the model, autonomous reasons emerged as a positive predictor of both challenge and aspired time. Controlled reasons emerged as positive predictor of both challenge and threat appraisals. In addition, a statistically significant interaction between goal-content and controlled reasons was found for threat appraisals (F change (2, 182) = 3.87, change in adjusted R^2 = .03, β = -.26, p < .01). The interaction is shown in Figure 2. A test of simple slope indicated that controlled reasons yielded a particular strong relationship with threat among runners selecting a dominant intrapersonal avoidance goal (b = 0.77, SE = 0.12, t = 6.47, p < .01), while the relation was less strong among runners endorsing a dominant intrapersonal approach goal (b = 0.31, SE = 0.18, t = 1.73, p = .08).

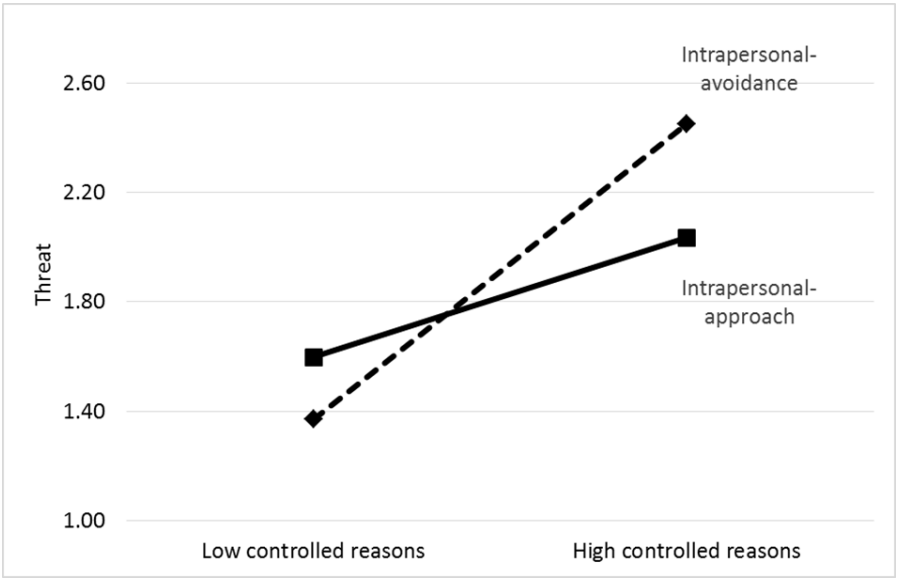

Figure 2: The interaction between intrapersonal goals (approach vs. avoidance) and controlled reasons underlying their pursuit.

Regarding the post-race outcomes, regression analyses showed that in Step 1 goal-content predicted performance, with approach-oriented runners running faster when compared to avoidance-oriented runners. When reasons underlying intrapersonal goals were considered in Step 2, autonomous reasons positively predicted need satisfaction, flow, and actual performance. In contrast, controlled reasons related positively to both types of self-talk (i.e., positive and negative). None of the two-way interactions was significant in Step 3. Taken together, the regressions showed the additional predictive validity of autonomous and controlled reasons underlying the pursuit of intrapersonal goals for almost all outcomes.

Table 3: Hierarchical regression analyses for pre-race and post-race measured variables.

Predictors	Pre-race outcomes			Post-race outcomes					
	Challenge (N = 188)	Threat (N = 188)	Aspired time (N = 184)	Positive self-talk (N = 159)	Negative self-talk (N = 159)	Autonomy satisfaction (N = 158)	Competence satisfaction (N = 158)	Flow (N = 153)	Perfor-mance (N = 176)
Step 1									
Gender	.08	.18**	.52**	-.14	.02	-.05	-.13	-.06	.51**
Age	-.27**	-.32**	.14*	.01	-.18*	.01	-.10	-.01	.16*
Intrapersonal goals	.11	-.06	-.28**	.10	-.04	.06	.14†	-.05	-.27**
F	7.43**	10.62**	34.07**	1.60	1.77	0.32	2.55	0.31	32.11**
Adjusted R^2	.09	.13	.35	.01	.01	.00	.03	.00	.34
Step 2									
Gender	.08	.18**	.52**	-.15[05]	.01	-.04	-.13	-.06	.51**
Age	-.23**	-.25**	.12[05]	.07	-.14	.01	-.07	.01	.16*
Intrapersonal goals	.02	-.09	-.24**	.04	-.07	-.02	.07	-.10	-.24**
Autonomous reasons	.41**	-.06	-.16**	.12	.02	.47**	.34**	.22*	-.15*
Controlled reasons	.10	.38**	-.04	.28**	.24**	-.17*	.02	.03	.04
F change in R^2	23.97**	16.46**	4.27*	9.32**	4.69*	19.26**	10.23**	3.86**	2.94[06]
Adjusted R^2	.27	.26	.37	.11	.06	.18	.13	.02	.36

Note. Intrapersonal goals: 0 = avoidance goal; 1 = approach goal. * $p < .05$. ** $p < .01$.

Hypothesis 5: Explanatory role of self-talk and need satisfaction

Next, we investigated whether self-talk and need satisfaction in conjunction explain the association between type of intrapersonal goals (i.e., approach-avoidance) along with its underlying reasons and flow. We did not include actual performance because three of the four presumed mediators (i.e., positive and negative self-talk, autonomy and competence need satisfaction) were unrelated to actual performance. Indeed, neither positive self-talk (r = .02, *ns*), negative self-talk (r = .13, *ns*), or autonomy need satisfaction (r = .06, *ns*) were correlated with actual performance among runners endorsing intra-individual goals. Nevertheless, actual performance (expressed in time, so the lower the better) was negatively correlated, as expected, to competence need satisfaction (r = -.28, p < .01). Also, by constraining the number of included variables in the process model, we kept the ratio of observations to estimated paths at a reasonable level (otherwise the sample would have been shrunk considerably due to listwise deletion).

The process model, shown in Figure 3, yielded the following fit: Satorra-Bentler χ^2 (18, N = 154) = 28.89, p = .05, CFI = .953, SRMR = .053, RMSEA = .063 (90%-CI: .002 - .103). Consistent with the regression analyses, both positive and negative self-talk were positively predicted by controlled reasons but not by autonomous reasons or type of pursed intrapersonal goal. In turn, positive self-talk was positively and negative self-talk was negatively associated with flow. A follow-up bootstrap analysis of multiple mediators (Preacher & Hayes, 2008) showed a non-significant total indirect effect (N= 171; 95%-CI: -.0872; .0401). That is, the two opposing indirect effects through positive (95%-CI: .0329; .1182) and negative self-talk (95%-CI: -.1561; -.0418) evoke two opposing mediational processes, with positive self-talk enhancing and negative self-talk undermining flow.

Further, need satisfaction was positively predicted by autonomous reasons, and in turn positively related to flow. Specifically, the positive indirect effect of autonomous reasons to flow via need satisfaction was

significant (β = .21, z = 2.92, p < .01). Notably, a statistically significant path was found between intrapersonal-avoidance versus intrapersonal-approach goals and flow. This path suggested that intrapersonal-avoidance goals predicted more flow as compared to intrapersonal-approach goals, a finding upon which we return in the discussion.

Discussion

Drawing upon the intersection between Self-Determination Theory (SDT) and the Achievement Goal Approach (AGA; Vansteenkiste, Lens et al., 2014), we sought to examine whether the type of achievement goals long distance runner set for themselves and the underlying reasons for doing so relate to their race perception, their actual experience of the race, and their performance. Hereby we focused on an understudied type of achievement goals, that is, intrapersonal goals (Elliot et al., 2011), which we deemed to be especially salient in long distance runners. Furthermore, we investigated whether runners' self-talk and need satisfaction could serve as mediational variables in their goal directed functioning.

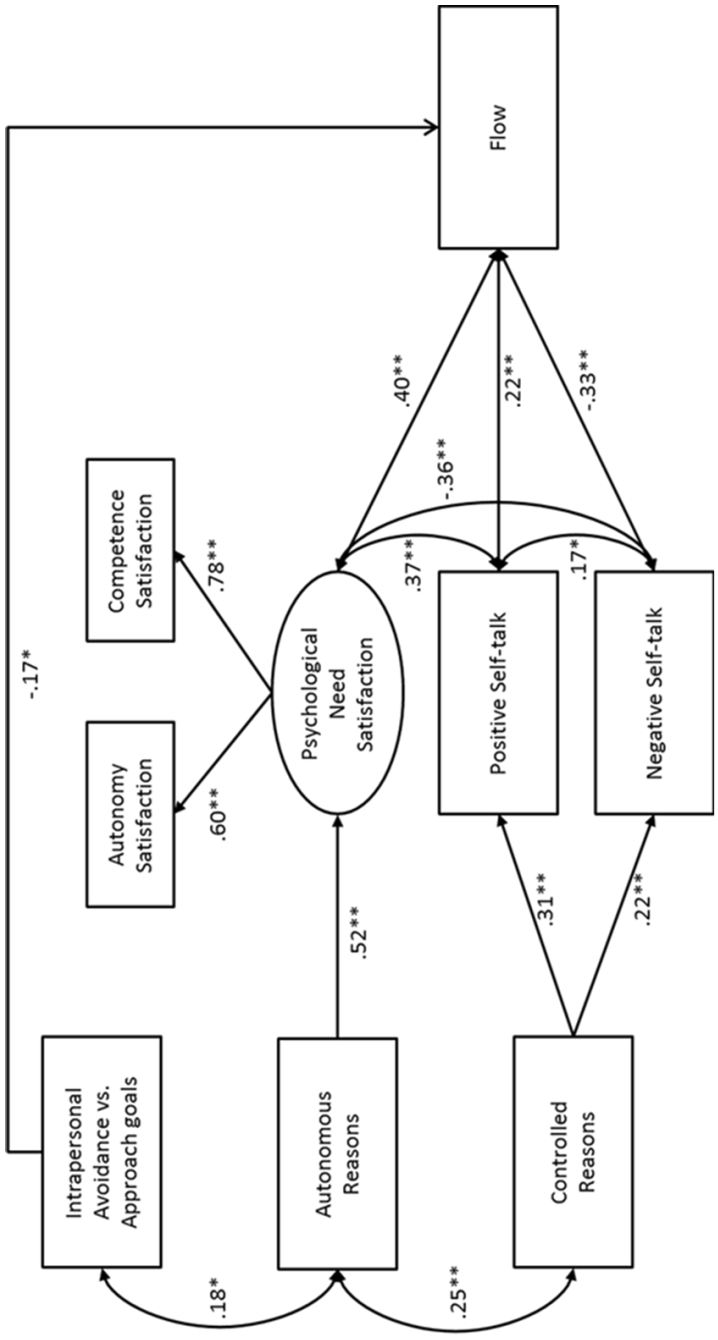

Figure 3: Results of the final process model.

Note: * $p < .05$; ** $p < .01$

The "What" of Achievement Goals

Consistent with our expectations, the vast majority (i.e., approximately 90%) of the participating long-distance runners preferred a dominant intrapersonal goal over an interpersonal goal. Thus, rather than focusing on outperforming their peers, aiming at their own previous performances seemed to constitute a critical target for these long-distance runners. The reduced prevalence of interpersonal goals is consistent with previous studies in the educational (Van Yperen, 2006) and sports domain (Vansteenkiste, Mouratidis, et al., 2014), in which interpersonal goals were also found to be the least prevalent. Of the runners adopting an intrapersonal goal as their primary goal, a larger percentage (i.e., 56.3%) appeared at the starting grid with the goal of improving their last performances. The remaining 43.7% of the runners were focused more dominantly on avoiding performing worse than last time, thus, pursuing an intrapersonal-avoidance goal.

Next, we examined whether runners adopting a different dominant achievement goal would report different pre- and post-race outcomes. Overall, in contrast to what can be expected on the basis of the AGA (e.g., Van Yperen, 2006; Elliot et al., 2011), the differences were fairly minimal. The minimal differences can likely be partly explained by (a) the lack of sufficient power due to the small percentage of runners in the interpersonal goal profiles and (b) the fact that we did not take into account to what extent athletes with a particular dominant goal may also have endorsed, yet to a lesser degree, another type of goal (i.e., a multiple goal perspective).

In spite of these statistical and methodological concerns, the effect that emerged consistently was the association between the valence dimension of achievement goals and runners' aspired as well as actual running time. That is, individuals adopting an approach goal aspired to a faster time prior to the race and also tended to run faster than those adopting an avoidance goal. In subsequent analyses, thereby controlling for the reasons underlying achievement goals, these relations remained statistically significant.

Interestingly, the studied mediators (i.e., self-talk and need satisfaction) could not explain these performance effects. Also, threat appraisals, which have been found to be predicted by avoidance goals in the past (Adie, Duda, & Ntoumanis, 2008), were not related to achievement goal-content in this study. It is possible that this inconsistency is due to the way we assessed achievement goals (i.e., the dominant-goal procedure which involves a categorical rather than a continuous measure). As we cannot provide a definite answer, future research will need to revisit this issue and may consider different mediators that could explain the association between achievement goals and performance. Given that intrapersonal-approach goals have been found to relate positively to energy (Elliot et al., 2011), runners who came to the start with such an achievement goal in mind may have felt more energized. Their elevated energy may lead them to aspire more ambitious and sharper times and to overcome potential barriers during the race, leading them to be more successful than their counterparts with an intrapersonal-avoidance dominant goal. However, these approach oriented runners seemed to experience less flow, which is rather against theory and our expectations. Perhaps as they set a more ambitious running time before the race, this might have caused them to be preoccupied by their target time, which may have led them away from flow experience. This explanation is speculative though as we did not find evidence for a negative correlation between aspired running time and flow experience. Future research should replicate this finding, also because the effect did not appear when the underlying reasons and the mediators were not taken into account.

The "Why" of intrapersonal goals

Extending previous research on the intersection of the AGA and SDT (e.g., Gaudreau, 2012), the present study sought to examine whether the "why" of achievement goals yielded any unique predictive power when intrapersonal goals were studied. This was indeed the case. A number of

findings deserve being highlighted. First, the "why" component proved an additional predictive asset next to the "what" component as all studied outcomes were related to either autonomous or controlled reasons underlying intrapersonal achievement goals. Such findings are consistent with several previous studies on the combination of achievement goals and underlying reasons (e.g., Vansteenkiste, Mouratidis, et al., 2010; Michou et al., 2014; Michou, Matos, Gargurevich, Gumus, & Herrera, 2016).

Second, autonomous motivation was characterized by an overall positive pattern: to the extent runners autonomously regulated their intrapersonal goals, they were more ambitious in the time they were targeting, appraised the race more as a challenge, reported greater need satisfaction and flow during the race, and eventually ran faster. Need satisfaction was found to completely account for the positive contribution of autonomous reasons to flow. Interestingly, self-talk was not predicted by autonomous motivation. Perhaps, autonomously motivated runners get so fully absorbed in the running experience itself that they more easily lose track of time and circumstances. Because of their potential reduced preoccupation with their aspired time, they may be less likely to engage in self-talk, either positive or negative. That is, self-talk may constitute a *corrective* motivational tool to boost one's own motivation. Such a motivational boost may especially be needed if one finds out that one is running behind schedule and thus may surface as a result of encountered need frustration. Future research could more directly tap into runners' preoccupations with time and their time checking during the race to examine whether it varies as a function of runners' "what" and "why" of achievement goals and whether it relates to self-talk and flow.

Third, in contrast to the pronounced positive pattern for autonomous motivation, controlled motivation related to fewer outcomes and, if so, yielded a more ambiguous pattern of relations. That is, in contrast to their autonomous counterparts, runners reporting controlled reasons for pursuing an intrapersonal achievement goal seemed more conflicted towards their goal, as illustrated by the fact that they appraised the race both as a challenge and as a

threat. Furthermore, the pressure they experienced may have led them to be more preoccupied with their running time and, as a result, get engaged in both positive or negative self-talk to regulate their goal directed behavior. Noticeable, the pattern of results concerning controlled motivation was not as negative as expected. At least three explanations can be rendered here. First of all, the negative effects of controlled motivation might be more readily pronounced in a team sport like soccer where a bad performance may cost a player's spot on the team. Because failure under pressure has more immediate ramifications, it may come with a more pronounced cost. Second, we only included a few negative outcome variables. As previous studies (e.g., Haerens et al., 2015; Gillet et al., 2014) pointed out that controlled motivation primarily relates to need frustration rather than to low need satisfaction, investigating more negative outcomes may have yielded more significant contributions of controlled motivation. Furthermore, controlled motivation in running may have fewer implications on short-term outcomes like flow and performance, but might surface over time in the form of dropout (Sarrazin et al., 2002). A third explanation for our findings can be that the effect of controlled reasons may be partly due to the type of achievement goal to which they are tied. Past research shows that controlled reasons underlying 'suboptimal' goals (i.e., interpersonal goals) yield strong negative patterns (Vansteenkiste, Mouratidis, et al., 2010), while controlled reasons for 'more adaptive' goals (i.e., task goals) do not carry these negative effects (Vansteenkiste, Mouratidis, et al., 2014). Given the small number of runners holding a dominant interpersonal goal in the current study, we cannot draw any firm conclusions. Future research should address this limitation by sampling a greater percentage of interpersonal-oriented athletes.

Two other findings deserve to be highlighted. First, a significant interaction between intrapersonal goals and controlled motivation in the prediction of pre-race threat appraisals emerged, indicating that runners holding an intrapersonal-avoidance goal while standing under pressure were especially vulnerable to perceive the race as threatening. Thus, controlled

motivation especially related to threat for those who focused on avoiding to do worse than last time. A similar interactive effect was reported by Gillet et al. (2014) who found autonomous reasons to amplify the positive contribution of interpersonal-approach goals on goal attainment (see also Gaudreau & Braaten, 2016). Yet, except for this one interaction, no other significant interactions emerged, which is in line with other studies in the sports domain (e.g., Vansteenkiste, Mouratidis, et al., 2010).

Second, performance was not related to any of the studied mediators, although it was related to achievement goal content and autonomous reasons. That is, contrary to several other studies (e.g., Blanchfield et al., 2014) and our expectations, positive self-talk was unrelated to performance. Yet, whereas in other studies (e.g., Schüler & Langens, 2007) runners were instructed to consciously use positive self-talk to overcome psychological difficulties during a marathon, we did not manipulate self-talk in the present study. Instead, we assessed self-talk in retrospect, through athletes' reports, that is, as they felt it had naturally occurred during the race. In other words, runners' use of self-talk was not necessarily a conscious attempt to regulate their ongoing behavior and goal striving, but may rather have emerged naturally. Further, need satisfaction was unrelated to performance, a finding that deviates from work by Mahoney, Gucciardi, Ntoumanis, and Mallet (2014) who found global need satisfaction during the season to relate to better performance in competitive cross-country runners via mental toughness. Mahoney et al. measured need satisfaction as a reflection of the whole season, which created mental toughness in athletes and thus better performance in an important end-of-season race. However, in the current study we assessed race specific need satisfaction. It is likely that this situational satisfaction of needs did not contribute to the mental toughness of our recreational runners and so did not facilitate objective performance.

Interestingly, self-talk and need satisfaction both contributed uniquely to the experience of flow. Whereas self-talk, both positive and negative, served as a rather cognitive explanatory process in the relation between

controlled motivation and flow, need satisfaction, as an affective experience, played a mediating role between autonomous motivation and runners' flow experience. Presumably, autonomous goal pursuit allows for a greater process focus, which is conducive to need satisfaction and a stronger immersion in the activity at hand. In contrast, controlled motivated runners may be more outcome-focused, which may trigger greater cognitive intervention in the form of positive or negative self-talk during the race. Although need satisfaction and both forms of self-talk were meaningfully related, the exact direction of the relation between both could not be addressed in the present study given that they were concurrently assessed. Likely, the relation between both variables is bi-directional. For instance, self-talk could emerge as a function of encountered need frustration, but positive self-talk could also allow one to preserve or even increase one's experience of competence need satisfaction (see De Muynck, Vansteenkiste, Delrue, Aelterman, Haerens, & Soenens, 2017). Future designs should assess need satisfaction and self-talk on multiple occasions to be able to pinpoint the exact relation between both variables. Furthermore, we recommend future studies to include an assessment of need frustration as well as it may be more strongly related to controlled motivation and give more easily rise to or follow from negative self-talk.

Limitations

Despite our design in which we included a pre- and post-assessment, we cannot draw any causal conclusion based on the current findings. Future experimental research inducing both particular achievement goals and particular underlying reasons before the race (see Benita et al., 2014) could shed light on this issue. Also, all assessments, except for performance, were subjective. It is advisable to complement at least some of the self-reports with more objective measures. Especially self-talk may not well be captured through self-reports due to retrospective bias (e.g., Zourbanos et al., 2011;

Zourbanos et al., 2014) and may be complemented by think-aloud procedures, which require participants to verbalize their inherent self-talk or thought content (e.g., Oliver et al., 2008). However, because of practical implications and possible interference with the race we did not opt for this procedure. Instead, we tried to limit the disadvantage of retrospective bias by assessing self-talk as soon as possible after the race and instructing participants to remember the race vividly before answering the questionnaire.

Conclusion

The present study was among the first to investigate the recently introduced theory of intrapersonal achievement goals and their underlying reasons in the context of sports. Based on the overall results, we conclude that the "why" of achievement goals yields additional explanatory power to the "what" of achievement goals in relation to runners' race experiences. Specifically, based on the current findings, we encourage runners to focus on improving their own best time (i.e., to adopt an intrapersonal approach goal) for more volitional (i.e., autonomous) reasons in order to feel challenged before the race, to experience flow during the race and to eventually perform better.

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Chapter 3

On the Game-to-game Variation in Soccer Players' Reasons Underlying Task-approach Goal Pursuit and Performance: The Role of Challenge and Threat Appraisals

Soccer players can appraise a competitive game either as a challenge or a threat. While recent research found players' achievement goals to relate to these competition appraisals, the question whether players' autonomous (i.e., volitional) and controlled (i.e., pressured) reasons for pursuing these achievement goals relate to these appraisals is less clear. In this 5-game diary study, we examined the degree to which players' game-to-game variation in pre-game challenge and threat appraisals is related to game-specific performance. Further, we examined if game-to-game variation in autonomous and controlled reasons underlying achievement goals may serve as motivational underpinnings of variation in these competition appraisals. Participants were 185 male Belgian football players (M = 26.57 years, SD = 5.97) who in most of the games (78.6%) reported pursuing a task-approach goal as their most dominant goal for the upcoming game. A multilevel, multivariate process model revealed unique positive links between game-to-game variation in autonomous and controlled reasons underlying task-approach goals and, respectively, game-to-game variation in challenge and threat appraisals. In turn, game-specific threat appraisals related negatively to coach rated performance during a specific game. The discussion focuses on how autonomous and controlled reasons underlying task-approach goals relate to competition appraisals and, in turn, to soccer performance.

Introduction

Consistent with arguments forwarded by Lazarus and Folkman (1984), athletes' challenging, relative to threatening, appraisal of an upcoming game depends on the perceived balance between the demands of a particular game and the available resources (Lazarus, 2000; Jones, Meijen, McCarthy, & Sheffield, 2009). Although these competition appraisals may well vary between athletes, each game is unique, carrying its own characteristics (e.g., different opponents, different ranking). Therefore, athletes' perceived balance and associated challenge and threat appraisals may also vary within the very same athlete across a series of competitive games (Folkman & Lazarus, 1985).

Shedding light on such game-to-game variation in appraisals may help us better understand why athletes may excel during some games, and underperform in some others (Jones, et al., 2009). If challenge and threat appraisals indeed vary from game to game, it is crucial to find out which factors coincide with these appraisals as to strengthen challenge and minimize threat appraisals. One critical factor that may covary with athletes' competitive appraisals is athletes' motivation for the upcoming game (Ntoumanis et al., 2014).

To address athletes' motivation, in the present study, we drew from two well-established theoretical frameworks, that is, the Achievement Goal Approach (Elliot, 2005) and Self-Determination Theory (Ryan & Deci, 2017). Specifically, congruent with the call to investigate the reasons for which athletes pursue achievement goals (Vansteenkiste, Lens, Elliot, Soenens, & Mouratidis, 2014a), we investigated the role of autonomous or volitional, relative to controlled or pressured, reasons underlying achievement goals. In particular, we examined the extent to which autonomous and controlled reasons relate to game-to-game variation in athletes' competitive appraisals, and whether, in turn, such appraisals predict game-to-game variation in athletes' performance, as rated by the coach.

Game-to-Game Variation in Challenge and Threat Appraisals

Challenge and threat appraisals are the responses that people display after taking into account the demand characteristics and their available resources in an achievement context. When athletes' available resources match or exceed the demands, they perceive the situation as a challenge, that is, as an opportunity for growth, mastery, and gain. However, when their resources fall short, athletes appraise the situation as a threat, that it may inflict harm or loss (Lazarus & Folkman, 1984).

These appraisals are presumed to have implication for athletes' affective responses and performance (Skinner & Brewer, 2002). Specifically, studies that focused on between-athlete differences found challenge appraisals, as compared to threat appraisals to relate to desired outcomes such as task-oriented coping (Laborde, Dosseville, Guillén, & Chávez, 2014), pleasant emotions (Adie, Duda, & Ntoumanis, 2008; Kavussanu, Dewar, & Boardley, 2014; Nicholls, Perry, & Calmeiro, 2014), self-esteem (Adie et al., 2008), and persistence (Ntoumanis, et al., 2014). Yet, few sport studies have investigated the relation of challenge and threat appraisals to performance outcomes. Among the few of the kind, it was found that interpersonal differences in threat, relative to challenge, appraisal was related to lower golf putting performance (Moore, Vine, Wilson, & Freeman, 2012). Similarly, participants in a threat state, as indexed by their physiological parameters, were found to perform worse in a baseball game (Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004) and on a cricket test (Turner et al, 2013) than participants who were in a challenge state.

To the best of our knowledge, the question whether challenge and threat appraisals vary within the same person across a series of competitive games and whether participants' performance covaries with these appraisals has been largely neglected in the sport literature. This is surprising given that challenge and threat appraisals are not solely a matter of trait-like characteristics but rather reflect a dynamic process, subjected to change from

sport event to sport event (and within the very same sport event - see Lazarus, 2000). That is, appraisals are considered to be shaped by multiple factors that may vary from day to day and from game to game. These changing factors encompass, among others, athletes' goal priorities (e.g., being mastery-oriented in one game and performance-oriented in the next one), their personal resources relative to demand characteristics (e.g., how tired a person feels during a game) as well as contextual characteristics (e.g., potency of opponents) (Lazarus, 2000).

Achievement Goals and Competition Appraisals

One possible antecedent of athletes' competition appraisals is the type of achievement goals players pursue (Lazarus, 2000; Meijen, Jones, McCarthy, Sheffield, & Allen, 2013). Achievement goals denote the aims athletes strive for in an achievement context (Elliot, 2005) and have been classified depending on how athletes define and valence competence (Conroy, Elliot, & Hofer, 2003; Elliot & McGregor, 2001; Elliot, Murayama, & Pekrun, 2011). Athletes are said to endorse mastery-approach goals if they define competence according to task-related or self-referenced standards and valence competence positively, thereby instigating an approach orientation. In case athletes define competence similarly yet valence it as a negative outcome to be avoided, they are said to strive for mastery-avoidance goals. In sport settings, athletes do not exclusively pursue mastery goals but they also hold performance goals, in which case they define competence on the basis of interpersonal standards. Parallel to mastery goals, also interpersonal (cf. performance) goals can be approach or avoidance oriented, depending on whether athletes valence competence positively or negatively. Practically speaking, athletes who adopt mastery-approach goals aim at improving or mastering their skills, while those who endorse mastery-avoidance goals aim at avoiding stagnation or performing less than they possibly could. Accordingly, athletes who pursue performance-approach or performance-

avoidance goals aim at outperforming or not being outperformed by the others, respectively (Conroy, et al., 2003; Elliot & McGregor, 2001).

Numerous studies have pointed out that mastery-approach goals yield the most desirable affective (e.g., enjoyment; Morris & Kavussanu, 2009) and behavioral outcomes (e.g., Elliot, Curry, Fryer, & Huguet, 2006), followed by performance-approach goals, with the two avoidance goals being the least adaptive (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010; Senko & Dawson, 2017). Further, recent meta-analytic studies in sport have indicated that approach goals are superior to avoidance goals with both mastery-approach and performance-approach goals being equally effective in the prediction of objective or rated performance (Lochbaum & Gottardy, 2015; Van Yperen, Blaga, & Postmes, 2014).

A similar pattern of findings has been reported for athletes' competition appraisals. In a heterogeneous sample of team sport athletes, Adie et al. (2008) reported that mastery-approach goal pursuit related positively to athletes' challenge appraisals and negatively to threat appraisals of a hypothetical stressful competition. In contrast, mastery-avoidance goals related positively to threat appraisals, while performance-avoidance goals related negatively to challenge appraisals. Interestingly, performance-approach goals appeared to be a mixed blessing, yielding a positive relation to both challenge and threat appraisals. Extending this cross-sectional work, Adie, Duda, and Ntoumanis (2010) showed in a longitudinal, 5-wave 2-season study that young elite soccer players' increasing pursuit of mastery-approach goals coincided with increases in players' challenge appraisals and with decreases in threat appraisals, whereas an increase in mastery-avoidance and performance-avoidance goals related to increases in threat appraisals of a hypothetical stressful soccer game. However, inconsistent with Adie et al. (2008), shifts in performance-approach goal pursuit appeared unrelated to either challenge or threat appraisals. Furthermore, Kavussanu and colleagues (2014) found in a heterogeneous sample of collegiate athletes that only mastery-approach goals (and not performance-approach goals) relate

positively to challenge and negatively to threat appraisals just prior to an actual team trial selection procedure. Finally, whereas both mastery-avoidance and performance-avoidance goals were found to relate positively to threat appraisals among college athletes (Meijen et al., 2013), mastery-approach goals were unrelated to challenge appraisals in that sample (but see Adie et al., 2010). In sum, challenge appraisals have been positively linked to mastery-approach goals and (inconsistently) to performance-approach goals. Threat appraisals have been positively associated with mastery-avoidance, performance-avoidance and performance-approach goals, whereas negatively with mastery-approach goals. Herein, we propose that a more dynamic look on the variation of challenge and threat appraisals as well as a consideration of the reasons underlying achievement goals may help to shed deeper insight in these relations.

Autonomous and Controlled Reasons Underlying Achievement Goal Pursuit

In an attempt to provide further insight into the question when achievement goals yield desired motivational outcomes, Vansteenkiste, Lens, and colleagues (2010, 2014a) argued that next to the content of the achievement goals themselves (i.e., the "what"-component) also the reasons (i.e., the "why"-component) for adopting and striving for a particular achievement goal deserve consideration. Drawing upon Self-Determination Theory (SDT; Deci & Ryan, 2000), these reasons were conceptualized as more autonomous or controlled in nature. When autonomously regulated, the achievement goal is fully endorsed or owned by the athlete, presumably because one finds the achievement goal enjoyable, interesting, or personally important and meaningful. In contrast, when controlled regulated, the achievement goal is rather imposed upon the athlete by internal (e.g., to avoid feelings of guilt or shame or to attain contingent self-worth) or external (e.g., to avoid punishment or to attain rewards) pressures.

A growing number of recent studies in sport have shown that considering the reasons underlying the pursuit of achievement goals allows for the prediction of a host of critical athlete outcomes. For instance, in the first study on this topic, Vansteenkiste, Mouratidis and Lens (2010) focused on reasons underlying the pursuit of performance-approach goals. Their cross-sectional findings revealed that, more than the strength of pursuing performance-approach goals, it were the controlled reasons underlying them that related positively to young adult soccer players' immoral behavior, as indexed by self-reported unsportpersonship behaviors, (non)physical antisocial behaviors and aggression. A follow-up diary study (Vansteenkiste, Mouratidis, Van Riet, & Lens, 2014b) focused on mastery-approach goals (with a task-based reference) through the use of the dominant goal approach (Van Yperen, 2006). Specifically, volleyball players were required to select their most important achievement goal for an upcoming game. Consistent with findings in other life domains (e.g., Brophy, 2005; Michou, Vansteenkiste, Mouratidis, & Lens., 2014), mastery-approach goals (i.e., task-approach goals) appeared the most preferred achievement goals above any other type of achievement goal (i.e., they appeared the dominant goal in 74% of the choices). Furthermore, results indicated that across a series of 6 games, game-to-game variation in volleyball players' autonomous reasons (but not controlled reasons) for endorsing task-approach goals related positively to game-to-game variation in prosocial behavior towards teammates, enjoyment of the game, and performance satisfaction. While athletes' motivation and outcomes were assessed concurrently in these studies, in a prospective study among adult long-distance runners (Delrue et al., 2016), a pre- and post-race assessment was used. Runners being autonomously motivated for pursuing either a dominant intrapersonal-approach or intrapersonal-avoidance goal (i.e., mastery goals with self-referenced standard), as assessed before the race, were found to run faster and to experience greater flow, whereas runners pursuing these same goals for controlled reasons reported engaging in more self-talk, both positively and negatively, during the race.

The more adaptive correlates of autonomous, as compared to controlled, motivated achievement goals, even when they concern the pursuit of mastery-approach goals (i.e., both task- and self-referenced standards), have also been observed in the educational domain. Autonomous regulation of achievement goals is found to predict diverse outcomes, including behavioral engagement (e.g., Benita, Roth, & Deci, 2014), learning strategies (Michou, Matos, Gargurevich, Gumus, & Herrera, 2016; Michou et al., 2014), and goal attainment (Gillet, Lafrenière, Vallerand, Huart, & Fouquereau, 2014).

Herein, we argue that the appraisal of the competition may be one variable which can play a role in understanding the different correlates of autonomous and controlled reasons underlying achievement goals. Specifically, we suggest that both classes of reasons may differentially relate to competition appraisals, and in turn to performance, because different underlying reasons mobilize different personal resources. Some indirect evidence for this hypothesis exists. Delrue and colleagues (2016) showed that interpersonal differences in autonomous reasons for goal striving were positively linked with challenge appraisals and running performance, whereas controlled motives were positively linked with both challenge and threat appraisals of an upcoming competitive event. However, in that study Delrue et al. did not report on the possible relation of competition appraisals to athlete outcomes, such as performance. In contrast, Ntoumanis and colleagues (2014) did report such associations, thereby focusing on athletes' autonomous, relative to their controlled, reasons for goal pursuit in general. Specifically, autonomous goal pursuit predicted greater behaviorally recorded persistence on an increasingly enduring ergometer task, an effect that was accounted for by athletes' challenge appraisals.

Building on this line of research, we aimed to investigate whether autonomous and controlled reasons underlying the pursuit of achievement goals relate to challenge and threat appraisals, and in turn to an outcome that perhaps is most highly valued in sport settings, athletic performance.

Furthermore, given both challenge and threat appraisals (Lazarus et al., 2000) and underlying reasons for goal pursuit (Vansteenkiste et al., 2014b) can vary from situation to situation, we take this issue one step further by taking into account possible intrapersonal dynamics in both challenge and threat appraisals and underlying autonomous and controlled reasons for goal pursuit in relation to performance.

Present Research

In the current diary study, we recruited a sample of soccer players to examine in a process model whether game-to-game variation in challenge and threat appraisals can explain why game-to-game variation in autonomous and controlled reasons underlying athletes' dominant achievement goals relates to game-to-game variation in performance. In doing so, we attempt to bring the literature on competition appraisals and the motivation literature closer to each other, thereby going beyond past work in a number of ways. First, as appraisals may well fluctuate across situations (Lazarus, 2000), a within-person instead of a between-person design is used. Second, while appraisals have been related to various outcomes, their link with performance deserves further attention. By using coaches as raters of players' performance, we aimed to control for same-source method bias (Podsakoff, MacKenzie, & Podsakoff, 2012) when examining the relation of challenge and threat appraisals to performance. To further control for coaches' bias to rate their players' performance more favorably after a victory than after a tie or a loss, we also controlled for the outcome of the game. Third, while such a within-person design has been used in past work focusing on reasons underlying achievement goals (Vansteenkiste et al., 2014b), in these studies motivational and outcome measures were assessed concurrently, that is, after the game only. In the present study, a pre-game and post-game design was used such that the proposed independent variables (i.e., reasons underlying achievement goals) and mediator (i.e., appraisals) were measured prior to an upcoming

game while the outcome (i.e., performance) was assessed after each game. By separating the timing of the mediator and outcomes, stronger conclusions regarding the direction of relations can be drawn (Podsakoff, et al., 2012).

The following 4 hypotheses were tested. First, we anticipated that challenge and threat appraisals (but also autonomous and controlled reasons underlying the pursuit of achievement goals) would fluctuate significantly from game to game (Hypothesis 1). Second, as for the antecedents of appraisals, we hypothesized that game-to-game variation in autonomous reasons underlying pursuit of achievement goals would relate positively to game-to-game variation in challenge appraisals (Hypothesis 2a). This is because athletes who more wholeheartedly endorse their game-specific goals would have more energy available to mobilize personal resources (Moller, Deci, & Ryan, 2006), would display more readiness to take on the goal (Koestner, 2008) and would respond to environmental pressures in an open and flexible way (Skinner & Edge, 2002). In contrast, game-to-game variation in controlled reasons underlying pursuit of achievement goals was expected to relate positively to game-to-game variation in threat appraisals (Hypothesis 2b). In the case of controlled goal pursuit, athletes may be facing greater demands, the pursued achievement goals may have a more ego-validating character or, alternatively, athletes may perceive themselves to have less resources available for a given game (Moller, et al., 2006), thus perceiving the game as more threatening (Skinner & Edge, 2002; Ntoumanis et al., 2014). Next, as for the outcome of appraisals, we hypothesized, in line with the little accumulated empirical evidence (Blascovich, et al., 2004; Moore, et al., 2012), that game-to-game variation in challenge and threat appraisals would relate, respectively, positively (Hypothesis 3a) and negatively (Hypothesis 3b) to players' coach rated game-specific performance. Finally, we hypothesized the competition appraisals to serve as indirect variables in the relations between underlying autonomous and controlled reasons and coach rated performance (Hypothesis 4).

When investigating these issues, we controlled for the outcome of the game and we tried to take into account whether a particular game itself (independent of players' motivation) could be perceived as a challenge or as a threat by controlling for the *absolute* difference in league points of the opponent team relative to the players' own team.

Method

Participants and Procedures

This study was part of a broader data collection being held at the Ghent University, which aimed to examine the game-to-game variation of soccer players' perceived coaching style and motivational experiences (see Delrue et al., 2017). Participants who filled out at least one weekly questionnaire were 185 (M = 26.57 years, SD = 5.97; mean questionnaires completed per player = 3.43) soccer players, who belonged to 11 Belgian soccer teams (for a more detailed description of the sample and the procedures that were followed to recruit players and ensure their participation in the study, see Delrue et al., 2017). The study was approved by the ethical committee of the host university, the players were ensured that their participation would be volitional, that their responses would remain confidential, and that they could withdraw from the study whenever they decided so. After completing a baseline questionnaire (pre-diary phase), the players responded to a set of short questions for 5 consecutive weeks (diary phase), each time before and after their weekly game. The players needed about five minutes to answer to the questions (which took place in the changing room). Upon completion of the data collection, the participants were thanked, debriefed, and informed about the core findings of the study.

Measures

Pre-game measures.

Dominant achievement goal pursuit. Similar to Van Yperen (2006) and Vansteenkiste et al. (2014b), soccer players selected their most dominant achievement goal prior to every upcoming game by means of rank ordering procedure (1 = *Most favored*; 4 = *Least favored*). The four items tapping into the four achievement goals were taken from Achievement Goal Questionnaire-Sports (Conroy, et al., 2003). Following the stem "*During this game…*", players had to rank whether they favored a task-approach goal[1] ("… *to perform as well as I can*"), an interpersonal-approach goal ("… *to outperform my opponent*"), an interpersonal-avoidance goal ("… *to avoid performing worse than my opponent*"), or a task-avoidance goal ("*To avoid performing worse than I really could*").

Reasons underlying the dominant achievement goal pursuit. Following that same procedure, we then asked the players to indicate the reasons why they were planning to pursue the most favored goal. After reading the stem "Why did you favor this particular goal?" the players rated the autonomous (4 items; e.g., "*Because I like to pursue this goal*"; "*Because I find this a personally important goal*") and controlling reasons (4 items; e.g., "*Because I have to prove myself*"; "*Because I feel obliged by others [trainer, team members, parents, friends"] for doing so*") for which they were planning to pursue mostly that particular goal. After controlling for the nested structure of the data, as the players repeatedly answered to the same questions (see Geldhof, Preacher, & Zyphur, 2014), we found an internal consistency of α = .94 for autonomous motivation and α = .83 for controlled motivation subscale. A multilevel Confirmatory Factor Analysis (CFA) showed acceptable fit

[1] Because we chose to investigate players' task-based and interpersonal standards, we now continue using "task goals" and "interpersonal goals" instead of "mastery goals" and "performance goals", respectively.

$\chi^2(25) = 56.07$, $p < .01$, CFI = .932, SRMR (within/between) = .044 / .083, RMSEA = .047. Yet, one controlling item was allowed to cross-load (negatively) to the autonomous latent factor at both the within- and between-person level and one autonomous item "*Because I find this a personally important goal*" needed to be dropped.

Challenge and threat appraisals. For the purpose of the present study we shortened and adapted the *Challenge and Threat Construal Questionnaire* (McGregor & Elliot, 2002) to assess on a five-point Likert-type scale (1 = *Not at all true of me*; 5 = *Completely true of me*) to what extent players construed the forthcoming game as a challenge or as a threat. Players' perception of game-as-a-challenge were assessed through the following two items: "*I view the upcoming game as a challenge*"; and "*I often think about what it would be like if I did well in the upcoming game*". However, the internal consistency of this two-item scale was not satisfactory $\alpha = .33$. Given that this second item was positively correlated with the two threat items (both rs = .35, $p < .01$) we retained only the item "*I view the upcoming game as a challenge*" to assess game-to-game perceived challenge. In contrast to the perceived challenge subscale, the two-item perceived threat subscale (including the items "*I view the upcoming game as a threat*" and "*I am dreading the upcoming game*") yielded an acceptable internal consistency for a two-item scale ($\alpha = .56$). Although we used only one and two items to assess, respectively challenge and threat appraisals, prior studies have shown that challenge and threat could be successfully assessed through single items (e.g., Laborde, et al., 2014; Moore, et al., 2012)

Post-game measures.

Coach rated performance. Using a similar methodology as Mouratidis, Vansteenkiste, Lens, and Sideridis (2008), we asked the coaches to rate their players' technical, tactical, and physical performance after each game. The coaches rated their players on a 10-point Likert-type scale ranging

from 1 (*Very poor performance*) to 10 (*Very Good Performance*) and the internal consistency of this measure was acceptable (α = .85). An average score was created by aggregating the three items and was used as an index of players' performance. By using coach rated, rather than self-reported performances we were able to avoid the problem of shared method variance.

Plan of Analyses

In our preliminary analyses, we examined the descriptives followed by the frequencies of game-to-game endorsement of the most dominant achievement goal. We then examined within a single multivariate multilevel model (with weekly assessment being nested within players) the degree to which endorsing a dominant goal for autonomous or controlling reasons would be (a) related to challenge and threat appraisals as well as higher coach-rated performance and (b) appraisals mediate the association between reasons and performance. We opted for a multivariate multilevel model to examine within a single model the pattern of game-to-game relations among the variables under investigation, after controlling for between-players' differences. When testing our models, we controlled for the outcome of the game. All the variables were group-mean centered, except outcome of the game which was centered around draw (0) with positive values representing victory (1).

Results

Preliminary analyses

Among the 635 game-to-game reports, in 499 of them (78.6%) the players reported task-approach as the most dominant goal, followed by 55 (8.7%), 37 (5.8%), and 15 (2.4%) occasions where interpersonal-approach, task-avoidance, and interpersonal-avoidance was respectively the most

dominant achievement goal. There were also 29 reports (4.6%) where some players failed to indicate which was their most dominant achievement goal. Apparently, the chi-square statistic examining the frequency distributions of the four achievement goals was statistically significant χ^2 (3) = 1068.10, $p <$ .01 with the odds of reporting a task-approach goal as the most dominant goal being 9.1, 13.5, and 33.3 times higher than reporting, respectively an interpersonal-approach, task-avoidance, and interpersonal-avoidance goal as the most dominant goal. In light of the small number of observations for the three alternative goals, we tested our hypotheses by using only the 499 games in which the players reported task-approach goals as the most dominant goal.

Descriptive statistics and bivariate correlations for all the games (upper diagonal) and those games in which players reported task-approach goal as the most dominant goal (lower diagonal) are shown in Table 1. As can be noticed, outcome of the game (victory vs. tie vs. loss) was related positively to coach-rated performance. Also, the amount of points difference with the opponent team was negatively related to threat appraisals. Furthermore, autonomous and controlling reasons were positively interrelated and they both related positively to both challenge and threat appraisals. In addition, controlling reasons and threat appraisals were negatively related to coach-rated performance.

Table 1: Means, standard deviations and bivariate correlations among the measured variables in case of dominance of task-approach goals (below diagonal) and all the goals (above diagonal).

Variables		1	2	3	4	5	6	7	All goals (N = 635)	
									M	(*SD*)
Background variable										
1. Game outcome		-	.04	-.04	-.04	-.02	-.04	.42**	0.00	(0.89)
2. Points difference		.04	-	-.07	-.16**	-.09	-.16**	.06	0.66	(9.03)
Pre-game measures										
3. Autonomous reasons		-.07	-.11*	-	.28**	.44**	.06	.03	4.06	(0.60)
4. Controlled reasons		-.04	-.21**	.24**	-	.06	.37**	-.12	2.98	(0.76)
5. Challenge appraisals		-.05	-.06	.45**	.10*	-	.00	-.02	4.04	(0.59)
6. Threat appraisals		-.05	-.18**	.13**	.37**	.03	-	-.13**	2.50	(0.78)
Post-game measures										
7. Rated performance		.46**	.04	-.01	-.13*	-.02	-.13*	-	7.26	(0.97)
Task-approach goal (N = 499)	*M*	0.01	0.52	4.14	2.98	4.09	2.45	7.32	-	-
	(*SD*)	(0.88)	(9.06)	(0.51)	(0.75)	(0.57)	(0.77)	(0.96)	-	-

Note. * $p < .05$. ** $p < .01$. Game outcome was coded as -1 (loss), 0 (tie), and 1 (victory)

Primary Analyses

To test Hypothesis 1, we set up a null model (i.e., with no predictors) to examine the variance lying at the within- and between-athlete level through the inspection of the intraclass correlation coefficient (ICC). Consistent with our expectations and with the view that challenge and threat are dynamic, we found the variance lying at the within-person level to be about 69% and 38%, respectively. These percentages remained virtually unchanged when we controlled for the absolute difference in league points with the opponent team.

Next, we tested Hypotheses 2 and 3 through a multivariate multilevel model. The model, shown in Figure 1, showed acceptable fit $\chi^2(21) = 34.26$, $p = .034$, CFI = .977, RMSEA = .037, SRMR = .040. After controlling for the difference in league points with the opponent team, we found, in support of Hypothesis 2a, autonomous reasons underlying dominant task-approach goal pursuit to positively relate to challenge appraisals (explained variance, 2.2%), whereas controlled reasons related positively to threat appraisals (explained variance 13.8%). Notably, the initial positive correlations between autonomous reasons and threat and controlled reasons and challenge (Table 1) disappeared when entering both reasons and appraisals simultaneously in the model. As for the performance outcome associated with appraisals, in support of Hypothesis 3b, we found threat appraisals (but not challenge appraisals; cf. Hypothesis 3a) to predict negatively coach-rated performance. This association emerged after controlling for the positive contribution of the game outcome (see Figure 1). Finally, a test of indirect effects showed that the relation between controlling reasons underlying the pursuit of a dominant task-approach goal and athletes' coach-rated performance by means of threat appraisals was marginally significant (b = -0.04, SE = 0.02, p = .079), providing partial support for Hypothesis 4.

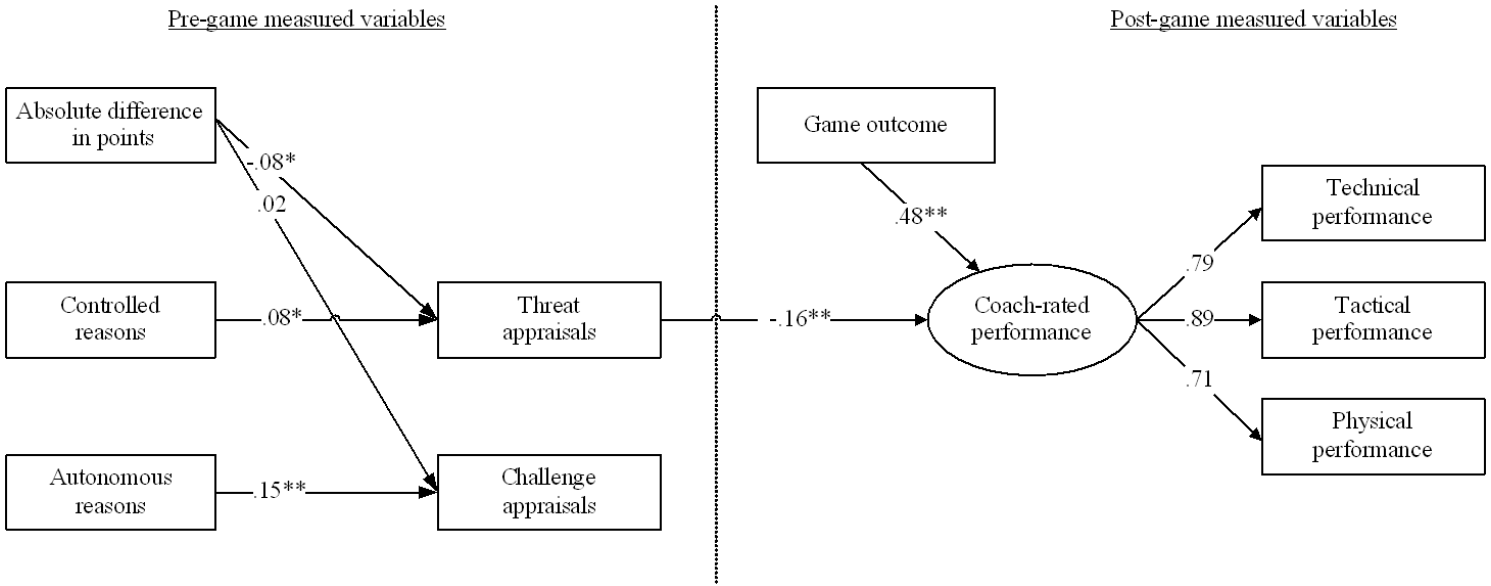

Figure 1: Game-to-game relations among autonomous and controlled reasons underlying the pursuit of task-approach goals, challenge and threat appraisals and coach-rated performance.

Note. * $p < .05$. ** $p < .01$. All paths are standardized. Relative standing is expressed in absolute points difference in the league between players' opponent and own team. Game outcome was coded as -1 for loss, 0 for tie, and +1 for victory.

Discussion

Recent studies have shown the importance of athletes' appraisals of a competitive event with respect to their performance (e.g., Turner et al., 2013). To the best of our knowledge however, no study has investigated possible fluctuation in athletes' appraisals from one competitive event to another and its covariation with game-specific performance. By using a prospective diary design with soccer players, we aimed to contribute to the existing literature by (a) investigating the intrapersonal variance in challenge and threat appraisals from game to game and (b) examining the explanatory role of these appraisals in the relation between the autonomous or controlled reasons underlying goal pursuit and players' rated performance from game to game.

The current results demonstrate that in the games that players pursued a task-approach goal because they ascribed personal significance to such goal or because they find it fun they were more likely to perceive the upcoming game as a challenge. In contrast, when players felt pressured to pursue the goal because of some contingent rewards or to avoid guilt or shame, they tended to perceive the upcoming game as a threat, resulting in a less favorable performance rating by their coach. In what follows we discuss the theoretical and practical implications of these results.

Variation in Challenge and Threat Appraisals and Underlying Reasons

The current study was the first to investigate the possible game-to-game variation in challenge and threat appraisals of soccer players and found significant intrapersonal changes in soccer players' challenge and threat appraisals from game to game. As such, the current results complement previous research that indicates that competition appraisals can shift in the run up to an important event (Skinner & Brewer, 2002) and across an entire season (Cummings, Turner, & Jones, 2016). Given that players' appraisals are formed by evaluating the balance between the demands of the situation and the

available resources to address those demands (Lazarus, 2000), such game-to-game variation indeed seems intuitive. That is, the numerous factors influencing this balance (e.g., strength of the opponent, strength of the own team, etc.) are likely to undergo significant changes from one game to another. For example, players' anticipation of whether the upcoming game will be tight may influence the extent to which they perceive that game as a threat. This is also what the results imply as the absolute difference in ranking points between players' own team and the opponent team was negatively associated with the appraisal of threat. So, other things being equal, the smaller the gap with the opponent, the more that game was considered as threatening.

Notably, the intrapersonal variance in challenge appraisals was higher than for threat appraisal. Perhaps, challenge appraisals are more susceptible to change because they are more influenced by situational factors that change from game to game. In contrast, the smaller percentage of intrapersonal variance in threat appraisals suggests that these appraisals are more a function of stable trait-like personal factors, such as perfectionistic concerns (Crocker, Gaudreau, Mosewich, & Kljajic, 2014). As this was the first study to look at appraisals from a dynamic perspective, more diary research is needed to confirm the amount of intrapersonal variance in threat and challenge appraisals.

Furthermore, in line with Vansteenkiste et al. (2014b), soccer players most often chose a task-approach goal as their dominant goal. Although competition instigates an interpersonal reference of competence, it seems that athletes prioritize being and staying task-oriented in these circumstances. Yet, there is considerable variation in their reasons for adopting task-approach goals, which can be more autonomous and volitional or controlled and pressured. This variation has implications in the achievement goal literature as it not only confirms the importance of considering the underlying reasons for pursuing achievement goals in sport (Vansteenkiste et al., 2010; 2014a; Delrue et al., 2016), but also shows the significance of considering underlying reasons from a dynamic perspective (Vansteenkiste et al., 2014b).

Reasons Underlying Task-approach Goal and Appraisals

Based on their findings, Kavussanu and colleagues (2014, pp. 591) argued that athletes can best adopt a mastery goal (i.e., task-based or intrapersonal reference) as they are less likely to expect harm or loss and thus perceive the situation as a less threatening one. However, when considering the underlying reasons for task-approach goal pursuit, it appears that task-approach goals may not invariantly come with greater challenge and less threat appraisals. Specifically, the current results suggest that pursuing task-approach goals for controlling and autonomous reasons is, respectively, positively associated with a threat and challenge appraisal. Presumably, the *functional meaning* attributed by players to their task-approach goal (Deci & Ryan, 2000) is function of their undergirding reasons, which, in turn, explains which appraisal manifests for an upcoming game. That is, in case athletes' ego gets interwoven with their task-approach goal pursuit (i.e., controlled regulated), the task-approach goal is experienced as more evaluative and, as a result, the demands of the upcoming game are perceived to be more taxing. Contrary, when players have autonomous reasons for their task-approach goal, such goal pursuit is experienced as more informational and growth-conducive, such that athletes perceive themselves to have more energy and resources available to take on the demands of an upcoming game.

The current results further support previous research in sport and other life domains, concerning the differentiated correlates of autonomous and controlled reasons underlying task-approach goal pursuit (e.g., Benita, et al., 2014; Gaudreau & Braaten, 2016; Michou et al., 2016; Vansteenkiste et al., 2014b). Specifically, the current results appear, to echo the results reported by Ntoumanis et al. (2014) and Delrue et al. (2016), who indicated that more autonomously regulated goal pursuit related to more challenge appraisals, while more controlled regulation was associated with more threat appraisals.

Furthermore, in the current study, the more threatening players appraised an upcoming game, the lower the coach rated their performance

after the game. These results are in line with experimental work on the association between threat and challenge appraisals and objective performance (e.g., Blascovich et al., 2004, Moore et al., 2012; Turner et al., 2013). Importantly, these experimental studies typically use a single index of challenge versus threat appraisals and, hence, are unable to disentangle the unique effects of both appraisals. Ntoumanis and colleagues (2014), however, did report the separate effects and found only challenge appraisals to facilitate persistence on an ergometer cycling task, whereas our results show only threat appraisals to impair performance. Several differences between this and our study may explain these discrepant findings. First, although in both studies performance was not self-reported, Ntoumanis and colleagues measured objective cycling performance, while in our study performance was rated by the coach. Second, the performance measure in the current study consisted of ratings of soccer players' physical, tactical and technical performance, thus reflecting the quality of their performance, whereas the persistence measure in Ntoumanis and colleagues' study was more quantitative in nature as it concerned athletes' physical output on an ergometer cycling task. More research is needed to unravel this issue, thereby distinguishing between both more qualitative and quantitative aspects of performance.

Further, a threatening competition appraisal helped to explain the negative relation between controlled reasons underlying task-approach goals and players' performance, thus suggesting that appraisals play an intervening role. Other processes in between the reasons underlying achievement goals and outcomes have been addressed in other studies. For example, autonomous reasons for an interpersonal-approach goal have been positively linked to goal attainment through increased goal directed effort (Gillet et al., 2014). In sports (Delrue et al., 2016), both need satisfaction and self-talk served as simultaneous mediators between runners' reasons underlying intrapersonal goals and their flow experience. Future research may consider each of these empirically validated mediators simultaneously, thereby considering a chain of intervening processes. Some of these processes may take place prior to a

sport event (e.g., competition appraisals), while others occur during the event itself (e.g., need satisfaction, self-talk, effort-expenditure). To illustrate, athletes' controlled reasons for pursuing an achievement goal may trigger a threatening appraisal, which, in turn, may elicit more negative self-talk and need frustration during task execution, leading one to more easily disengage or underperform. Of course, each of these processes may mutually reinforce one another during task execution.

Limitations and Future Research

Although the current study has several strengths including the use of multiple informants and the prospective diary format, there are some limitations to be noted that future research could consider. First, given our homogenous sample of male soccer players, these results are to be confirmed in other sport samples that would include females. Second, the overwhelming preference for task-approach pursuit restricted our analyses to the games in which players selected a dominant task-approach goal. As a consequence, we were unable to (a) investigate the role of the achievement goal as such (the "what") (e.g., Gaudreau & Braaten, 2016) and (b) determine whether the current results would generalize to other achievement goals (e.g., Gillet et al., 2014). Third, it would be interesting in future research to not only investigate the "what" and the "why" but also the "how" of achievement motivation (Vansteenkiste et al., 2014a). That is, according to SDT, a more need-supportive coaching style leads to more autonomous (volitional) athlete motivation, while more need-thwarting coaching style instigates more controlled (pressured) motivation. Furthermore, the style of promoting a goal is considered to influence athletes' reasons for pursuing it (Benita et al., 2014; Gaudreau & Braaten, 2016). Given the dynamic nature of athletes' reasons for task goal striving, future research could go one step further and investigate the link between the "how" and the "what" and "why" of achievement motivation from a dynamic perspective.

Conclusion

Although players intuitively know they feel more challenged for one game, but more threatened for the other, this study was the first to capture these game-to-game fluctuations in players' competition appraisals and their link with coach-rated player performance. Further, players' appraisals appeared to coincide with players' goal motivation. Based on the current results, a more dynamic perspective on athletes' motivational underpinnings may allow for a better understanding of why athletes' competition appraisals vary across games and why athletes excel in one game, but underperform in the other.

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Chapter 4

A Game-to-game Investigation of the Relation between Need-supportive and Need-thwarting Coaching and Moral Behavior in Soccer [1]

[1] Delrue, J., Vansteenkiste, M., Mouratidis, A., Gevaert, K., Vande Broek, G., & Haerens, L. (2017). A game-to-game investigation of the relation between need-supportive and need-thwarting coaching and moral behavior in soccer. *Psychology of Sport and Exercise*, *31*, 1-10.

Although perceived need-supportive and need-thwarting coaching have received considerable attention, the question whether coach behavior fluctuates from game to game, with resulting associations with players' moral behavior has not been examined. A Belgian sample of soccer players (N = 197; M = 26.57) was followed during five competition games, with players completing measures both prior to and following each game, assessing pre-game and on-game perceived coaching as well as athletes' moral behavior.

Results of multilevel analyses indicated that there exists substantial variation in perceived need-thwarting and need-supportive coaching behavior from game to game. The game-to-game variation in perceived pre-game need-thwarting coaching behavior related positively to variation in the adoption of an objectifying stance, which, in turn, related to variation in antisocial behavior oriented towards the opponent, the referee, and even their own teammates. Variation in perceived on-game need-supportive and need-thwarting coaching behavior yielded an additional relation to team-related moral outcomes. Finally, supplementary analysis indicated that these effects also held for an objective marker of moral functioning (i.e., number of yellow cards) and that players' level of competition-contingent pay related to their antisocial behavior via an objectifying stance.

The discussion highlights the fluctuating and dynamic nature of motivating coaching behavior, and its association with players' moral functioning.

Introduction

Sport plays an important educational and social role (European Commission, 2007, White paper section 1) as it constitutes an ideal context where players can learn to follow rules, to constructively deal with authority figures (e.g., the referee) and to engage in prosocial behaviors. These prosocial behaviors, defined as voluntary acts that aim to help or benefit others, together with the absence of antisocial behaviors, defined as voluntary acts that disadvantage or harm others, are indicative of individuals' moral functioning in sports (Bandura, 1999, Kavussanu & Boardley, 2009; Sage & Kavussanu, 2007). Players' display of both prosocial and antisocial behaviors may vary substantially from game to game. While players may act prosocial during some games, they may verbally and physically aggress the referee, opponents, or even their teammates (e.g., Bredemeier, 1994) during other games, and as such display antisocial behaviors.

Certainly, such antisocial behaviors are not warranted and to optimize sports' educational and social role, we need to better understand the factors that promote prosocial or moral behaviors (such as helping an injured opponent) and make players vulnerable for the display of antisocial or immoral behaviors (such as retaliating after a bad foul). Among those factors coaches play a key role, as they constitute one of the primary socializing agents for players (e.g., Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010; Nucci & Kim, 2005). That is, coaches may prevent the occurrence of antisocial or immoral behavior, but they may also actively encourage or elicit such behavior, for instance by being critical or by inducing pressure to win, which can result in a winning-at-all cost attitude and a lack of respect and concern for the opponent, the rules of the game, and the officials (Nucci & Kim, 2005; Vallerand, Brière, Blanchard, & Provencher, 1997). Indeed, although players possess the self-regulatory capacity to refrain from antisocial behavior and instead engage in prosocial behavior (Bandura, 1991, 1999), under psychological need-thwarting circumstances players' vulnerability for

antisocial play may get evoked (Vansteenkiste & Ryan, 2013). In the context of a soccer game, the combination of a pressuring coach and a competitive environment may constitute such a need-thwarting context.

Recent cross-sectional research has linked coaching behavior with athletes' moral behavior (e.g., Hodge & Gucciardi, 2015), nevertheless the question whether game-to-game variation in coaching behavior relates to game-to-game variation in players' moral behavior has, to the best of our knowledge, not received any prior attention. Yet, given that the pressure imposed on players and the focus on winning at all costs may vary from game to game, it is sensible to expect that also players' capacity to engage in prosocial behavior as well as their vulnerability for displaying antisocial behavior varies from game to game. Therefore, in the present study, grounded in Self-Determination Theory (Deci & Ryan, 2000; Vansteenkiste & Ryan, 2013), we adopted a dynamic perspective towards coaching, thereby investigating whether players' engagement in prosocial and antisocial behavior varies from game to game depending, among other factors, on the need-supportive and need-thwarting style used by the coach both prior to and during the game.

Need-supportive and Need-thwarting Coaching

Within the SDT-perspective, a distinction is made between two broader coaching styles, that is, need-supportive and need-thwarting coaching. When need-supportive, coaches nurture athletes' basic psychological needs for autonomy (i.e., experience a sense of volition), competence (i.e., feeling effective) and relatedness (i.e., experience a warm relationship; Vansteenkiste & Ryan, 2013), thereby creating an ideal environment for athletes to benefit affectively (e.g., well-being; Adie, Duda, & Ntoumanis, 2012), cognitively (e.g., learning; Pope & Wilson, 2012), and behaviorally (e.g., prosocial behavior; Hodge & Lonsdale, 2011).

When need-supportive, coaches take their athletes' perspective, provide choices and stimulate initiative, as well as provide their athletes with meaningful rationales for assigned roles, tasks, or exercises (Mageau & Vallerand, 2003, Reeve, 2016). They also create a predictable and competence-enhancing environment, for instance by providing clear instructions, encouragements, and showing confidence in their athletes' abilities (Mageau & Vallerand, 2003; Reeve, 2009). Finally, when need-supportive, coaches are warm, helpful, and available to their athletes as to address their worries and anxieties (Williams, Whipp, Jackson, & Dimmock, 2013). Several studies have convincingly shown the presence of a "bright pathway" (see Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011) where coach need support relates to better adjustment and performance because athletes' psychological needs get better met (Mageau & Vallerand, 2003).

In contrast, some recent studies have revealed a "dark pathway" where coach need thwarting relates to need frustration which, in turn, relates to suboptimal or even maladaptive outcomes (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011) among which is antisocial behavior (Hodge & Gucciardi, 2015). Need thwarting – which does not simply mean the absence of need support (see Vansteenkiste & Ryan, 2013) as it engenders feelings of pressure (i.e., autonomy frustration), inferiority or failure (i.e., competence frustration) and social alienation and loneliness (i.e., relatedness frustration) – actively undermines athletes' basic psychological needs (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Haerens, Vansteenkiste, Aelterman, & Van den Berghe, 2016).

In particular, athletes' need for autonomy gets frustrated when their coach forces them to act, think, and feel in a prescribed way, for instance by using intimidation, displaying conditional regard, or exerting excessive control (Bartholomew et al., 2010; Reeve, 2009). Likewise, athletes' needs for competence and relatedness are thwarted when their coach is critical and destructive as well as distant and cold (Bartholomew, Ntoumanis, Ryan,

Bosch, et al., 2011). Such need frustrating experiences, in turn, relate to suboptimal or negative athlete outcomes such as a greater probability of burnout, depressive symptoms (Balaguer et al., 2012; Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011) and antisocial behavior (Hodge & Gucciardi, 2015).

Coaching and Moral Behavior

As suggested by Bandura (1999) morality implies not only doing good to others (i.e. prosocial behaviors), but also avoiding provoking harm to others (i.e., absence of antisocial behaviors), a distinction which has been shown to be relevant in the context of sport (e.g., Hodge & Lonsdale, 2011). To illustrate, in soccer, players may display prosocial behavior by helping an injured opponent or encouraging a team mate. In contrast, they may exhibit antisocial behavior by deliberately injuring an opponent or being critical towards teammates. Moreover, the social context – and therefore in part also the coach – can influence players' capacity to apply moral standards (Bandura, 1991,1999) such that players' more natural tendency to act prosocial may get supported or overridden.

Consistent with the presumed role of coaches, a few cross-sectional studies have shown perceived coach autonomy support to relate negatively to athletes' antisocial behavior towards both their own teammates and the opponent, and positively to prosocial behavior towards the teammates (Hodge & Lonsdale, 2011; see also Ntoumanis & Standage, 2009). In another cross-sectional study, Hodge and Gucciardi (2015) found perceived controlling coaching to relate positively to antisocial behavior towards both the opponents and teammates. In that study, these associations could be accounted for by athletes' moral disengagement, which refers to the psychological maneuvers that individuals use to transgress moral standards without experiencing negative affect (Bandura, 2002). One such maneuver is dehumanization, the process by which individuals perceive others not as humans but rather as

animals (i.e., animalistic dehumanization) or objects (i.e., objectification). Concerning the latter, Vansteenkiste, Mouratidis, and Lens (2010), found that soccer players' objectification of the opponent helped to explain why their experienced pressure to outperform their opponents related positively to antisocial behavior towards these opponents. Apparently, the pressure to win may lead soccer players to treat their opponents as barriers to be removed in the service of winning, thereby lowering the threshold to aggress opponents.

Another source of pressure may constitute of the monetary rewards soccer players receive for winning a game. According to Cognitive Evaluation Theory (CET; Deci, 1975), one of the mini-theories of SDT, tangible extrinsic rewards could be a potential source of pressure especially if the reward is made contingent upon the outcome of the behavior (Reeve & Deci, 1996; Vansteenkiste & Deci, 2003). Presumably, the higher the competition-contingent bonus players receive, the more they may feel pressured to win the game. Such heightened pressure may lead players to engage in any possible means necessary to attain the outcome of winning, even engaging in antisocial behavior. The threshold to engage in such antisocial behavior would be more easily achieved if the more the opponent is denied of human-like properties, that is, the more the opponent is objectified, a process that is more likely to occur if higher stakes are at play (i.e., if more money can be gained; see Vansteenkiste et al., 2010). Given that competition-contingent financial rewards are a very common practice in Belgium, even in the lowest leagues, it is worth exploring this issue.

Towards a More Dynamic View on Coaching

Most of the studies we reviewed herein focused on interpersonal differences in coaching behaviors, presuming that some coaches may be more need-supportive than others. Yet, the emphasis on these interpersonal differences overlooks the possibility that coaches' behavior may vary considerably from training to training and from game to game. We argue that

by taking into account the variation in perceived coaching behavior of a given coach, we avoid the bias that infiltrates when peoples' behavior is assessed through summary accounts over an extended period of time (Bolger, Davis, & Rafaeli, 2003), and it allows to more properly consider the complexities and subtleties of sport coaching. Despite coaches' reliance on a particular coaching style, coaches may display considerable variation around their own average as a function of changing circumstances (e.g., the pressure upon the game). If such intrapersonal variation would be found, it would allow us to adopt a more dynamic (instead of static) perspective on coaching.

Two lines of research provide indirect support for the existence of game-to-game variation in coaching style. First, intervention research indicates that a need-supportive and need-thwarting coaching style is malleable (for an overview see Su & Reeve, 2011), with coaches being capable to adopt a more need-supportive approach during the intervention (e.g., Cheon, Reeve, Lee & Lee, 2015). Second, in a longitudinal study, Stebbings, Taylor and Spray (2015) asked coaches three times in an eleven-month period to report on their coaching behavior. Results showed that approximately 30% of the variance in both autonomy-supportive and controlling coaching was situated at the within-person level. On a more short-term base, Vansteenkiste, Mouratidis, Van Riet and Lens (2014) found considerable (approximately 50%) game-to-game variation in the motivation of volley-ball players. Following the premises of SDT that player motivation is highly dependent on coaching behavior, the findings regarding the game-to-game variation in motivation can serve as indirect evidence for the dynamic nature of coaching behaviors as well. In short, although anecdotic evidence suggests that coaches need-supportive and need-thwarting coaching style would vary considerable across games, to date, there is only indirect evidence for this claim.

The Present Study

If we want to optimize sports' educational and social role, we need to better understand the growth-promoting factors that relate to prosocial behaviors (e.g., encouraging a teammate) as well as the risk factors that make players vulnerable for engaging in antisocial behaviors (e.g., retaliating after a bad foul). In the current study, we argue that coaches' motivating style and in particular the extent to which the coach is perceived to be need-supportive and need-thwarting, both prior to and during the game, may play a key role herein.

Specifically, we aimed to build on the existing literature (Hodge & Gucciardi, 2015; Hodge & Lonsdale, 2011; Vansteenkiste et al., 2010) in two ways. First, rather than using a one-shot assessment to study perceived coaching behavior and its relation to players' prosocial and antisocial behavior, our aim was to shed light on the game-to-game dynamics of coaching. To do so, we followed soccer players for five competition games, thereby assessing the perceived need-supportive and need-thwarting coach behaviors closely before players entered the pitch (i.e., after the coach's pre-game speech) and directly following the end of the game, while also obtaining assessments of prosocial and antisocial behavior after the game. Next, in light of the increasing evidence that the absence of need-supportive coaching does not necessarily denote the presence of need-thwarting coaching (e.g., Bartholomew et al., 2011; Vansteenkiste & Ryan, 2013), our second aim was to examine their independent contribution in the prediction of both the prosocial and antisocial outcomes, targeting the opponent, the referee as well as teammates (see also Van der Kaap-Deeder, Vansteenkiste, Soenens, & Mabbe, 2017) and to examine, in particular, whether the adoption of an objectifying stance, as an aspect of moral disengagement (Bandura,1999), would play an explanatory role herein. Three hypotheses were formulated.

First, in parallel with previous studies indicating substantial game-to-game variation in athletes' motivation (e.g., Vansteenkiste et al., 2014), we

hypothesized that there would be a similar game-to-game variation in the perception of need-supportive and need-thwarting coaching behavior before and during the game. Further, as players' capacity to apply moral standards and engage in moral self-censure may vary as a function of the social context (Bandura, 1991, 1999), we expected a similar game-to-game variation in players' objectifying stance (as assessed prior to each game) and their prosocial and antisocial behavior (as reported after the game).

Second, consistent with previous studies providing evidence for the growth-promoting role of need-supportive coaching and the detrimental effects of need-thwarting coaching (e.g., Bartholomew et al., 2011; Haerens, Aelterman, Vansteenkiste, Soenens, & Van Petegem, 2015; Haerens et al., 2016), we hypothesized that perceived game-to-game variation in pre-game need-thwarting (but not need-supportive) coaching would relate to game-to-game variation in antisocial behavior towards the opponent. With respect to the latter, we expected that the reason why need-thwarting coaching would relate to antisocial play is because need-thwarting coaching would lead players to adopt an objectifying stance towards their opponents (Vansteenkiste et al., 2010). Indeed, such an objectifying stance would lower players' threshold for displaying antisocial behavior as the opponent is denied of human-like features, and meanwhile is being reduced to an object that can be removed in the service of meeting external pressures. In a more explorative way, we examined whether the negative consequences of an objectifying attitude, as reported prior to the game, would generalize to antisocial behavior oriented towards the referee and, perhaps, even teammates (see Vansteenkiste et al., 2010).

Third, as we did not only assess perceived need-supportive and need-thwarting coaching prior to the game, but also tapped into players' perceived coaching style during the game itself (once the game was over), we examined whether need-supportive and need-thwarting coaching during the game would yield a supplementary contribution in the prediction of moral behaviors above and beyond pre-game coaching. Congruent with the presumed "bright" and

"dark" pathways, we expected that game-to-game variation in need-supportive coaching during the game would especially relate to game-to-game variation in prosocial behavior towards their own teammates, while game-to-game variation in need-thwarting coaching during the game would relate to game-to-game variation in antisocial behavior oriented towards the opponent.

Finally, in a more exploratory way, we investigated whether the same process of perceived need-thwarting coaching and objectification would be associated with a higher risk for players to receive a yellow or red card during the game, which can serve as an objective marker of moral functioning. Likewise, we explored the monetary reward players receive after a victory as a possible objective antecedent of the proposed process, assuming that such contingent reward acts as an external pressure for a player to win (Reeve & Deci, 1996; Vansteenkiste & Deci, 2003).

Method

Participants and Procedure

Eleven out of the 45 Belgian soccer teams, that were initially approached, agreed to participate in the study. One of the authors visited each of these participating clubs to explain the procedure of the study (e.g., that participants would have to complete a baseline questionnaire and five shorter questionnaires just before and after five competition games). The author ensured participation to be anonymous and volitional, and emphasized the players' right to quit at any time. Only few players denied participation and in total 197 participating players completed the baseline questionnaire. Following a baseline assessment that took place the earliest on the tenth game and the latest on the 14th game of the season (M = 11.52, SD = 1.25), a weekly game assessment occurred during five weeks (i.e., November and December 2013). All players including substitutes that were part of the squad for that particular game completed the pre- and postgame questionnaires, each of

which took about five minutes. Questionnaires were completed privately in the changing room. Players filled out the pre-game measure after the head coach's pre-game speech right before they entered the pitch, while the post-game measure, filled out by the players who participated in the game, was completed within a period of 30 minutes after the final whistle. Players completed the questionnaires with their head coach in mind. After finishing the last assessment, all players were debriefed, thanked, and received feedback on the importance of need-supportive coaching behavior. Also, in the months following the termination of the study, one of the authors informed the players on the main findings of the study during a club meeting. All participants received a free drink at the end of the data collection. The study was in line with the ethical recommendations of the host University.

The 197 male soccer players (M = 26.57 years, SD = 5.97) belonged to 11 different Belgian soccer clubs. 11 participants (5.6%) played in fourth national division, while 34 (17.3%), 58 (29.4%), and 39 (19.8%) played, respectively in the second, third, and fourth provincial league; also 55 (27.9%) players played in amateur league. On average, participants had been playing soccer for 19 years (M = 19.07, SD = 5.73), had 18 years (M = 18.28, SD = 5.96) of competition experience and had been playing with their current team for almost 5 years (M = 4.71, SD = 4.74). The number of training hours ranged from 0 to 11 hours per week (M = 2.99, SD = 1.93). At baseline, players had received on average one yellow card during the games preceding the measurements (M = 0.91, SD = 1.47). The players that informed us on their remuneration earned an average of 43.89 Euros (SD = 58.58) for a victory.

Measures

Because of the game-to-game study design and the measurements taking place repeatedly just before and after each game, the assessments were kept as short as possible to avoid fatigue in answering the questions[2].

Pre-game questionnaire.

Pre-game coaching. Three items from the Health Care Climate Questionnaire (HCCQ; Williams, Grow, Freedman, Ryan, & Deci, 1996) were adapted to the sport context to assess perceived need support during the pre-game speech of the coach (i.e., During the pre-game speech, the coach: "…was interested in how I would handle the game"; "…confirmed confidence in my abilities as a soccer player"; "…encouraged me to ask for clarification if instructions were unclear"; $\alpha = .84$). Likewise, inspired by the Controlling Coach Behavior Scale (CCBS; Bartholomew et al., 2010) and the parental psychological control scale (Barber, 1996), three items were created to assess need-thwarting coaching, thereby fitting the items to the particular situation at hand, namely the pre-game speech (i.e., "The coach pressured me by stressing the importance of a good result"; "The coach clearly indicated to be disappointed with a poor result"; "The coach was critical of past performances"; $\alpha = .93$). All the items were answered on a 5-point Likert-type scale ranging from 1 (*totally disagree*) to 5 (*strongly agree*).

Objectification. Players' objectification of the opponent was assessed through three, 5-point Likert-type scale items (1 = *Totally disagree*; 5 = *Strongly agree*), taken from the study of Vansteenkiste et al. (2010). An example item was "Today, I do not consider the opponents as a person but as an enemy" ($\alpha = .87$).

[2] Results of Confirmatory Factor Analysis and test of factorial invariances of all used variables are presented in Appendix.

Post-game questionnaire.

On-Game Coaching. Similar to the pre-game assessment, the players were asked to report their perception of coaching during the game. Specifically, the stem "During the past game…" was followed by four adapted items from the HCCQ tapping into need-supportive (i.e., "the coach explained why he/she wanted to change things"; "the coach tried to positively encourage me"; "the coach gave clear instruction concerning my game play"; "the coach was clear about how I could handle a specific game situation"; α = .94) and four items tapping into need-thwarting (i.e., "the coach pressured me", "the coach blamed me for mistakes", "the coach was critical about my game"; "the coach clearly showed his/her disappointment when I failed an attempt"; α = 86) coaching behavior.

Prosocial and antisocial behavior. The 20-item "Prosocial and Antisocial Behavior in Sport Scale (PABSS, Kavussanu & Boardley, 2009) was used to assess players' moral behavior during the game. The instrument consists of four components and the players indicated to what extent they exhibited (1) prosocial behavior towards teammates (e.g., "congratulated a teammate for good play"; α = .97), (2) prosocial behavior towards the opponent (e.g., "asked to stop play when an opponent was injured"; α = .96), (3) antisocial behavior towards teammates (e.g., "criticized a teammate"; α = .92) and (4) antisocial behavior towards the opponent (e.g., "retaliated after a bad foul"; α = 96). These components were assessed by various items and scored on a scale of 1 (*not at all*) to 4 (*always*).

Soccer players' resentment toward the referee was assessed with the stem "During the past game…" followed by two self-created items (e.g.," …I felt irritated when I was disadvantaged" and "…errors of the referee made me angry"; α = .91). Players answered on a 5-point Likert scale from 1 (never) to 5 (very often). Finally, to include a more objective indicator of antisocial behavior, we also asked players whether they received a yellow or red card. During the period of assessment, a total of 57 yellow cards but not one red

card was administered. Therefore, in subsequent analyses we only focused on yellow cards.

Plan of Analyses

Given the nested structure of the data (as the repeated-measures were nested within the players), we tested our hypotheses through multilevel modeling (Hox, 2010), with the repeated measures representing the within-player, game-to-game variability (Level 1). This analysis enabled us to examine the amount of variance lying at the within-player level (and thus, the degree of game-to-game variation). All models were estimated through full information maximum likelihood (FIML) with robust standard errors. First, we inspected the data for missing values. Twelve players (6%) were omitted from our analyses because they failed to sufficiently complete the survey. This resulted in a final sample of 185 players, who played at least one out of five games (M = 2.86, SD = 1.41, range from 1-5).

Next, we specified two multilevel Structural Equation Models to test our hypotheses, one for the continuous variables of prosocial and antisocial behavior and another one for the categorical variable of yellow cards (0 = no; 1 = yes). Although the results would remain virtually unchanged if we put all the variables in a single model, we opted to split our analyses in two models to get a fit estimate of our model with the continuous variables as outcomes – this option is unavailable when categorical variables are included as outcome. All predictors were centered around each player's mean score (group-mean centered). Further, for the sake of model parsimony, we removed the hypothesized paths that were statistically nonsignificant and we did the same for the non-significant correlations among the dependent variables.

Model fit was evaluated using Root Mean Square Error of Approximation (RMSEA < .05), Standardized Root Mean Square Residual (SRMR < .06) and Comparative Fit Index (CFI > .95; Hu & Bentler, 1999). Hypotheses were tested in conservative manner by controlling for the outcome of the game which was uncentered (with 0, -1 and 1 standing for tie, loss, and victory, respectively).

Results

Preliminary Analyses

Table 1 shows the correlations among the measured variables at the within-player level, with the last row displaying the variance lying at the within-person level (i.e., the game-to-game variance) as obtained through the estimation of the Intraclass Correlations. As can be seen, soccer players' objectification and moral behaviors as well as perceived coaching behaviors varied substantially from game to game, supporting our expectations.

Table 1: Bivariate correlations at the Within-person Level and the game-to-game variance.

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
Background variable													
1. Outcome game	-	-	-										
Pre-game measures													
2. Need-supportive coaching	3.14	.58	.07	-									
3. Need-thwarting coaching	3.19	.68	.13**	.07	-								
4. Objectification	2.99	.90	-.13**	.03	.07	-							
Post-game measures													
5. Need-supportive coaching	3.34	.57	.18**	.26***	.10*	.02	-						
6. Need-thwarting coaching	2.48	.56	-.04	-.06	.17***	.04	.11**	-					
7.Antisocial behavior-opponent	1.55	.43	-.03	.04	.06	.43***	.03	.05	-				
8. Prosocial behavior-opponent	1.72	.62	.18***	.03	.04	-.20***	.06	.06	.17***	-			
9. Antisocial behavior-team	1.62	.39	-.21**	-.01	.06	.24***	-.12**	.14***	.31***	.14***	-		
10. Prosocial behavior-team	2.80	.47	.21***	.11**	.02	-.03	.21***	-.07	.09	.24***	-.06	-	
11. Resentment-referee	2.44	.58	-.29***	.06	.02	.36***	-.01	.13**	.33***	-.11**	.31***	-.03	-
12. Money for winning[+]	43.89	58.58	-	.24*	.46*	.16	.32**	.15	.20	-.02	.18	.07	.26*
Game-to-game variance			-	.45%	43%	27%	49%	49%	33%	41%	42%	50%	46%

Note. **p* < .05; ***p* < .01; ****p* < .001. [+]Correlations of Between-person Level variable 'Money for winning' with the aggregated scores of the Within-person Level variables.

Pre-Game Coaching Behavior, Objectification and Moral behavior.

To analyze whether this variation from game to game in pre-game coaching behavior could account for variation in players' objectification and moral behavior, we specified a two-level Structural Equation Model at the within-players level, containing paths from pre-game coaching to all variables of moral functioning (i.e., objectification, prosocial and antisocial behavior towards the opponent and the team and resentment towards the referee) and paths from objectification to all variables of moral behavior during the game. This model, depicted in Figure 1, showed excellent fit ($\chi^2_{[24]} = 30.34$, $p = .174$; CFI = .979; SRMR = .039; RMSEA = .021). The model showed as expected positive relations between game-to-game perceived pre-game need-thwarting coaching behavior and game-to-game objectification of the opponent which in turn, related positively to game-to-game resentment to the referee and antisocial behavior towards both the opponent and the teammates, and negatively to prosocial behavior towards the opponents. Perceived pre-game need-supportive coaching did not contribute to this model, while supplementary analyses showed no direct relation between need-thwarting coaching to any of the moral behaviors. These findings suggest that the more the soccer players perceived their coach to display more need-thwarting behaviors prior to the game, the more they tended to objectify their opponents during that particular game and, as a result, the more they tended to behave antisocially.

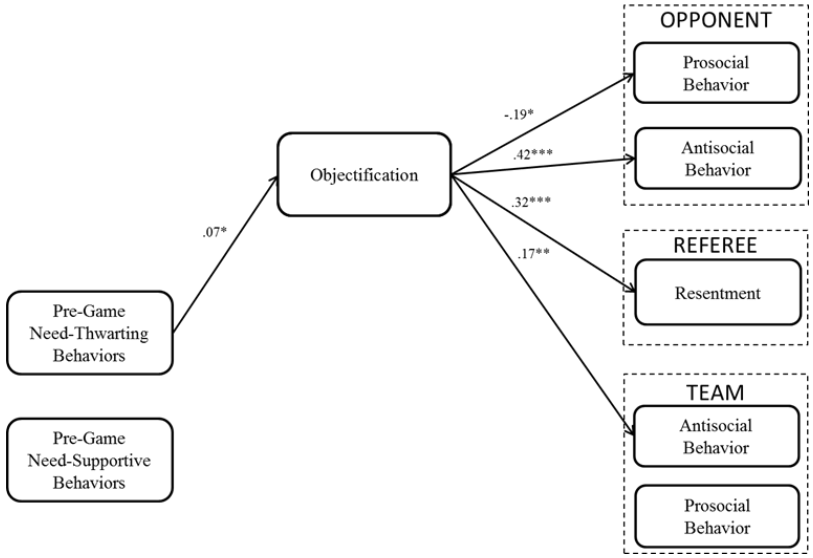

Figure 1: Multi-level Model displaying the association between game-to-game variation in pre-game coaching, objectification and moral outcomes.
The outcome of the game is controlled for; non-significant paths are not displayed and coefficients are standardized. *$p < .05$; **$p < .01$; ***$p < .001$.

On-Game Coaching and Moral Behavior.

Next, we entered on-game coaching in the model as predictor of all variables of moral behavior (i.e., prosocial and antisocial behavior towards the opponent and the team and aggression towards the referee). Furthermore, we allowed correlations between pre-game coaching and on-game coaching behaviors. This model (Figure 2) showed an adequate fit ($\chi^2_{[36]} = 65.613$, $p = .002$; CFI = .925, SRMR = .045 and RMSEA = .037) and accounted for in total 35% of the within-player variance in soccer players' outcomes. In line with the previous model, perceptions of pre-game coaching related to players' moral functioning via objectification of the opponent. Further, the more the soccer players perceived their coach to be need-supportive during the game, the more prosocial and the less antisocial behavior towards teammates they

exhibited. The opposite pattern of relations was found for on-game need-thwarting behaviors. Finally, game-to-game perceived need-thwarting coaching was positively related to game-to-game resentment vis-à-vis the referee.

Notably, all the above significant relations emerged above and beyond the influence of the result of the game (not shown in Figure 2). Specifically, winning a particular game was related positively to prosocial behaviors towards the opponents (β = .15, *SE* = 0.05, p = .002) and the teammates (β = .16, *SE* = 0.05, p = .001) and negatively to antisocial behavior towards the teammates (β = -.16, *SE* = 0.05, p = .001) and resentment towards the referee (β = -.25, *SE* = 0.04, p < .001) during that specific game.

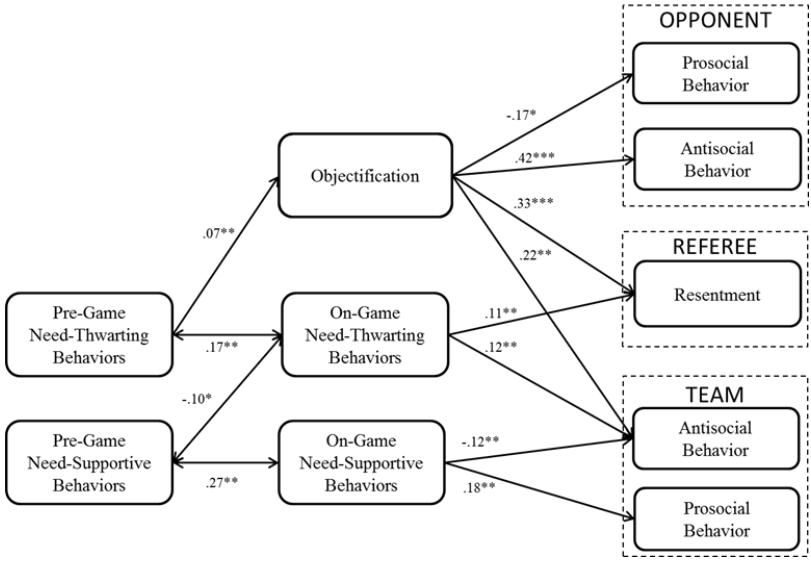

*Figure 2: Multi-level Model displaying the association between game-to-game variation in pre-game and post-game coaching, objectification and moral outcomes. The outcome of the game is controlled for; non-significant paths are not depicted and coefficients are standardized. *p < .05; **p < .01; ***p < .001*

Supplementary Analyses

Yellow cards as an outcome.

Consistent with our expectations, we found that during games players step on the pitch holding a more objectifying attitude, they had a greater likelihood of receiving yellow cards (β =.16, *SE* = 0.07, *p* = .027), with the odds being 1.36 times higher for players who scored high (i.e., 1 *SD* above the mean) in objectification. Neither the outcome of the game (β = -.05, *SE* = 0.08, *p* = .503), nor perceived on-game need-supportive (β = .01, *SE* = 0.07, *p* = .926) or need-thwarting coaching (β = -.04, *SE* = 0.07, *p* = .639) were statistically significant correlates of yellow cards. Finally, given that objectification was positively associated with perceived pre-game need-thwarting coaching, we examined whether game-to-game variation in perceived pre-game need-thwarting coaching would indirectly relate to receiving yellow cards by means of objectification. The indirect effect appeared marginally significant (*B* = 0.05, *SE* = 0.03, *p* = .072), suggesting that objectification could be a mechanism through which perceived pre-game need-thwarting coaching relate to on-game misbehaviors that result in a yellow card. Further, no red cards were administered during the period of assessment and thus we were deemed to refrain from these analyses.

The role of monetary rewards.

Finally, we investigated in the subsample (not all players agreed to share their remuneration) for which we had the relevant information (*N* of players = 83; Mean of played games per player = 3.46), whether monetary reward as a between-person (grand-centered) predictor after a victory would relate to objectification or any kind of prosocial or antisocial behavior. The model showed that money received after a victory positively related to game-to-game objectification (β = .25, *SE* = 0.10, *p* = .009), resentment towards the referee (β = .30, *SE* = 0.12, *p* = .013), and antisocial behavior towards the opponent (β = .25, *SE* = 0.11, *p* = .020). Taken together, these findings suggest

that the more money players were promised to receive after a desired outcome, the more they tended to objectify their opponent, the more they behaved antisocially towards the opponent, and the more they resented the referee.

Discussion

In the present prospective, repeated-measures study we adopted a dynamic view on coaching and sought to investigate whether (1) there was game-to-game variation in soccer players' perceived need-supportive and need-thwarting coaching behaviors, as assessed prior to and directly following the game; (2) game-to-game perceived pre-game coaching would relate to soccer players' moral behavior as displayed during the game via the adoption of an objectifying stance; (3) game-to-game perceived on-game coaching would explain game-to-game variation in moral behavior above and beyond players' perceived pre-game coaching behavior.

Game-to-Game Variation in Perceived Coaching Behavior

The current findings showing substantial variations in players' perceptions of their coaches' need-supportive and need-thwarting behavior resemble those reported by Tsai, Kunter, Lüdtke, Trautwein, and Ryan (2008) in the academic domain, who found students' perceived autonomy-supportive and controlling teaching behavior to vary substantially from one lesson to another.

Such findings suggest that it may be inaccurate to exclusively classify or portray coaches as being either need-supportive or need-thwarting. Although soccer players picked up differences in the coaching behavior between coaches, as about half of the variance was situated at the between-person level, the substantial game-to-game variance suggests that both need-supportive and need-thwarting behaviors could belong to coaches' behavioral repertoire. Said differently, perceived coaching behavior is fairly dynamic in

nature, with all coaches undergoing fluctuations around their own average across games. Such game-to-game fluctuation may result from various personal (e.g., coach's need satisfaction; e.g., Mabbe, Soenens, Vansteenkiste, Van der Kaap-Deeder, & Mouratidis, 2016) and situational sources (e.g., importance of a particular game) that future research may want to unveil.

Pre-game Coaching Behavior and Moral behavior

Concerning our second objective, we anticipated that soccer players who felt pressured and were reminded by the coach of their poor previous performance right before kick-off, would be more likely to perceive their opponents as obstacles on their way to success that should be removed at any means, even immoral ones. The present findings supported this hypothesis. During games that soccer players perceived their coach to be more need-thwarting during the pre-game speech, they were more likely to objectify their opponent and, in turn, to display more antisocial and less prosocial behavior towards their opponent during that particular game. Similar findings were reported in a cross-sectional study by Hodge and Gucciardi (2015), who found that athletes' perception of controlling coaching during the season was positively related to antisocial behavior via moral disengagement. The current results replicate these findings involving only one specific mechanism of moral disengagement (i.e., objectification) and in the context of specific competitive games rather than the entire season. We acknowledge that, in the interpersonal context of a soccer game, other mechanisms of moral disengagement, which we did not assess, may be operative as well. Euphemistic labeling, for example, may play a role in that injuring an opponent in the service of wining is perceived to be "part of the game" on the soccer pitch. Alternatively, players may blame the opponents for playing aggressively as a way to justify their immoral behavior as a case of self-defense (i.e., attribution of blame; Bandura, 1991).

Notably, the harmful correlates of an objectifying stance in the current study also manifested using an objective indicator. During games that players treated their opponents as objects, they had a greater likelihood to receive a yellow card. Adopting an objectifying stance may lower the threshold for morally unacceptable behaviors because such behaviors may perhaps be considered 'an integral part of the soccer game' by those buying into such an objectifying attitude. Although referees can administer a yellow card for other reasons than aggression vis-à-vis the opponent (e.g., for contesting a decision of the referee), it is instructive to note that in the present study an objectifying attitude was related to this penalization marker.

Three additional findings deserve being highlighted. First, the antisocial behaviors displayed by players adopting an objectifying stance during a specific game were not limited to the opponent, but generalized to both the referee and even to teammates. The expressed resentment towards the referee is understandable given that referees decide on the penalization of antisocial behaviors. What seems striking is that the experienced pressure that forms the basis for adopting an objectifying stance during a particular game co-occurred with players showing a harsher and more critical attitude towards their own teammates. It appears that once players objectify their opponents, they might also turn against their teammates by shouting, swearing, or even condemning them for their poor performance. Antisocial behavior towards teammates may as well be explained by a spillover mechanism where the pressure to win may make players to transfer this pressure to their teammates, for example by being very critical of their teammates errors. As this is presumably the first study that documents evidence for such a spill-over phenomenon, this finding needs replication.

Second, while pre-game need-thwarting coaching positively related to various maladaptive outcomes, including objectifying stance, perceived pre-game need-supportive coaching did not relate to these outcomes. The more pronounced role for need-thwarting as a correlate of maladjustment is consistent with recent theorizing and empirical work (Bartholomew et al.

2011; Haerens et al., 2015; Vansteenkiste & Ryan, 2013), which shows that dynamics of need thwarting and need support constitute two different pathways. Specifically, these studies show that need support is more likely to correlate positively with beneficial variables such as vitality, psychological growth and autonomous motivation, and less likely to correlate negatively with maladaptive variables such as amotivation and maladjustment. An opposite pattern was found for need-thwarting socialization. Taking into account the lack of negative association between need support and objectification, the current results are in line with this recent theorizing on the "bright" and "dark" side of human motivation (Bartholomew et al., 2011; Haerens et al., 2015).

Third, apart from the role of game-to-game variation in pre-game need-thwarting coaching behavior, also interpersonal differences in the monetary incentives involved in participating in the game were associated with objectification of the opponent. As the financial rewards increased, the stakes for wining got higher. Presumably, players who receive a greater competition-contingent bonus for winning the game may perceive greater pressure to win the game at all means, which relates to a greater tendency to objectify their opponents (Vansteenkiste et al., 2010). Such an objectifying stance, in turn, may lead them to engage in any kind of mean to get to the outcome of winning, even the display of antisocial behavior towards opponents and resentment towards the referee. Future research may want to directly examine the hypothesis that a higher competition-contingent bonus adds more pressure (see Reeve & Deci, 1996).

On-Game Coaching Behavior and Moral Functioning

Not only the pre-game speech but also variation in perceived on-game need-supportive and need-thwarting coaching related to players' prosocial and antisocial behavior. The current results, which speak to the coaching-player dynamics at a game-to-game level, are in line with previous studies that link

coaching behavior to moral functioning in sport on a cross-sectional level (Hodge & Gucciardi, 2015; Hodge & Lonsdale, 2011). Specifically, a perceived need-supportive approach by the coach seems to spill over to the way how players interact with each other, as teammates become more mutually supportive and helpful during a particular game in case their coach is supportive of their psychological needs and instead become critical of each other in case they perceive their coach to be need-thwarting. These are promising findings as prosocial behaviors are well known to foster team cohesion and subsequent team performance (Bray & Whaley, 2001), while the team cohesion will plummet and even result in conflictual relations in case players display antisocial behavior towards each other.

Interestingly, whereas on-game coaching related to prosocial and antisocial behavior towards teammates, it did not relate to players' reactions towards opponents, a finding which stands in contrast with the contribution of pre-game coaching. A number of reasons can be provided. First, on-game coaching may fail to relate to prosocial and antisocial behavior towards the opponent due to its operational definition in the current study. Items mainly focused on the encouragement or criticism of players' competence rather than on the pressure to beat the other team. As the target of the operationalization of on-game coaching lies within the own team, it is less likely that such coaching would relate to behavior towards the opponent. A second possibility is that other factors than the coach, such as the opponents' behavior during the game or the ranking of the other team, may play a more critical role in the prediction of players' prosocial and antisocial behavior towards opponents, an issue that could be explored in greater detail in future research.

Although perceived on-game need-thwarting coach behaviors did not relate to the way soccer players interacted with their opponent, it did relate to their reactions to referee decisions. In fact, players who perceived their coach as need-thwarting in a particular game resented more the referee during that game. When soccer players are subjected to need-thwarting environments, they may try compensating their need frustration by projecting their anger

onto the referee. Indeed, under need-thwarting environments, people are at greater risk of suboptimal functioning (Vansteenkiste & Ryan, 2013). Presumably, the pressuring stance of the coach during the game may evoke a more defensive mode of functioning, as reflected by the expressed resentment against referee decisions. Important to note is that all the above-mentioned relations linking perceived coach behavior with moral behavior were found over and above the outcome of the game, as we controlled for the latter during model testing.

Although the perceived coaching style related to soccer players' moral functioning on a game-to-game basis, future research in sport may want to study other critical factors, including opponents' behavior as such or players' motivational functioning. Also, at the between-person level, it would be instructive to consider both players' more stable traits (e.g., dispositional motives, moral values etc.), which may either buffer against or exacerbate the harmful correlates of need-thwarting coaching as observed herein. By including a variety of other resources as well as interpersonal differences variables in athletes' functioning more credits could be given to the complex and dynamic nature of sport coaching.

Practical Implications

The present study yields three important practical implications. First, it seems naïve to classify coaches as need-supportive or need-thwarting. Although coaches may have certain tendencies to act in a need-supportive or need-thwarting manner, their behavior seems to undergo substantial fluctuations from game to game. Such a more dynamic viewpoint towards coaching underscores the idea that need-supportive coaching behaviors belong to every coach's repertoire (although not always apparent), while coaches are also vulnerable to display need-thwarting behavior. Future research may want to shed light on the contextual factors (such as the

importance of a particular game) that may foster (or circumvent) game-to-game need-supportive and need-thwarting coaching.

Second, the present findings suggest that once coaches realize the impact of their pre-game and on-game coaching on players' intra-team moral behavior, they may be even more willing to get trained to adopt a more need-supportive approach (see Cheon et al., 2015). Such training would urge coaches to avoid need-thwarting behaviors such as overly criticizing their players for their past performances and putting pressure upon them. Meanwhile, it would encourage them to instruct their players about how to handle specific game situations as the current results show that such need-supportive coaching behavior is associated with less conflicting and more positive, helpful and supportive intra-team dynamics, as evidenced by players' engagement in more prosocial and less antisocial behavior towards teammates.

Third, given the fact that monetary rewards were associated with an objectifying stance and antisocial play, it might be important to reconsider the role of such rewards in soccer. Apart from potentially killing the fun of the game (Deci, Ryan, & Koestner, 1999; Vansteenkiste & Deci, 2003), it seems that the monetary rewards, which are quite high in Belgium even among young players playing in amateur teams, might also influence players' moral functioning on the pitch. That is, despite their symbolic role, as monetary rewards contain informative competence feedback and provide a confidence boost, they may as well add pressure upon the soccer players to win the game at all means.

Limitations

First, all variables (including the number of received yellow cards) were assessed through self-report, such that the observed associations may be driven by common method-variance. Although we treated receiving a yellow card as an objective indicator of aggressive and antisocial behavior, we need

to acknowledge that in soccer a yellow card is not only administered to penalize such aggressive behavior. Further, one can argue that players' perceptions of on-game coaching was colored by the outcome of the game, as the former was assessed post-game, when the result of the game was known to the players. To counter this possibility, we tested our models conservatively, controlling for this covariate. Second, the observed associations between studied variables are correlational in nature. To infer causal conclusions, in future research soccer coaches could be trained how to give a need-supportive pre-game speech and to coach in a need-supportive way during the game to examine whether such manipulation will affect athletes' moral behavior during the game. Third, we did not assess relatedness-supportive or relatedness–thwarting coach behaviors in the current contribution. Future studies can focus on relatedness support as well as it may contribute to greater prosocial behavior (Pavey, Greitemeyer & Sparks, 2011). Fourth, given the game-to-game study design, we aimed to keep the measurements as short as possible. However, future research may include a more comprehensive measure of need-supportive and need-thwarting coaching. Further, we made some adaptions to the anchors of the PABSS. Although the scale proved to be sufficiently valid, we recommend future research to use the common anchors of the scale. Fifth, the current contribution focused on objectification as one mechanism of moral disengagement. Nevertheless, drawing upon the work by Bandura (1991,1999) and Kavussanu and colleagues (2007, 2009), we acknowledge that future research might include a broader variety of mechanisms of moral disengagement, including the displacement of responsibility to their coach or co-players or the minimization of the detrimental impact of their behavior. Finally, given that all participants in the current study were male soccer players, caution is warranted when generalizing the results to non-soccer contexts and females.

Conclusion

Taking together, it appears that a perceived need-thwarting approach by the coach during a specific game may come with several costs. Perceiving the coach as more need-thwarting (i.e., pressuring towards a good result and being critical about past performance) before the game covaries with players' objectification, antisocial behavior, and hostility during the game. Further, when players perceive their coach to be need-thwarting during the game (i.e., blaming players for mistakes and showing disappointment in competencies) they pick up a similar attitude, as manifested by the display of similar antisocial behaviors (i.e., criticizing and verbal abuse) towards their own teammates as well as the referee. Coaches, however, can play as well a motivating role during the game by encouraging and instructing players in a need-supportive way, resulting in positive intra-team interactions (i.e., helping and supporting teammates)

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Appendix

Note.

Pre-Game coaching. A multilevel Confirmatory Factor Analysis (CFA) showed good fit to the data ($\chi^2_{[16]} = 20.30$, $p = .207$; CFI = .988; RMSEA = .021; SRMR = .033). Also, a test of factorial invariance (where constraints were imposed on the structure of the model, the loadings of the items, and the correlation between the two latent factors) showed acceptable fit: $S\text{-}B\chi^2_{[60]} = 64.37$, $p = .326$, CFI = .992, SRMR = .066, RMSEA = .028 (90% CI: .000 - .072). This finding provided evidence that the expected fluctuation of perceived pre-game coaching from game to game might be only partly due to game-to-game measurement error. Further, as part of the baseline measure we assessed soccer players' general perception of coaching behavior by means of validated scales (i.e., Health Care Climate Questionnaire and Controlling Coaching Behavior Scale). We used this information on general coaching behavior to relate these validated measures to players' scores on their game-specific three-item reports. Results showed that general need-supportive coaching positively predicted mean levels of perceived pre-game need support ($\beta = .53$, $p < .001$), but not to pre-game need thwarting ($\beta = -.03$, $p = .809$). Likewise, general need-thwarting coaching positively predicted mean levels of perceived pre-game need-thwarting coaching ($\beta = .37$, $p = .001$) but not pre-game need-supportive coaching ($\beta = .15$, $p = .139$).

Objectification. A multilevel CFA showed the following fit: $\chi^2_{[1]} = 0.54$, $p = .465$; CFI = 1.00; RMSEA = .000; SRMR = .002. A test of factorial invariance (with constraints being imposed on the structure of the model, and the loadings of the items) showed acceptable fit: $S\text{-}B\chi^2_{[8]} = 8.11$, $p = .423$, CFI = 1.00, SRMR = .032, RMSEA = .010 (90% CI: .000 - .103). This finding provided evidence that the expected fluctuation in objectification from game to game might be only partly due to game-to-game measurement error.

On-Game coaching. A Multilevel CFA showed acceptable fit to the data ($\chi^2_{[18]} = 31.50$, $p = .025$; CFI = .979; RMSEA = .036; SRMR = .035). Also, a test of factorial invariance (with constraints being imposed on the structure of the model, the loadings of the items, and the covariance between the two latent factors) showed reasonable fit ($S\text{-}B\chi^2_{[123]} = 209.62$, $p < .001$, CFI = .928, SRMR = .089, RMSEA = .072 (90% CI: .068 - .094)), providing evidence that the fluctuation from game to game might not be driven to large extent because of game-to-game measurement error. Further, general need-supportive coaching positively related to perceived on-game need-supportive coaching ($\beta = .55$, p < .001), but not on-game need-thwarting coaching ($\beta = .20$, $p = .137$). Likewise, general need-thwarting coaching was positively related to perceived on-game need-thwarting coaching ($\beta = .58$, $p < .001$) but not on-game need-supportive coaching ($\beta = -.08$, $p = .514$).

Prosocial and antisocial behavior. A Multilevel CFA where we let the errors between two items from prosocial team behavior subscale ("…gave positive feedback to a teammate" and "…helped an opponent off the floor") to correlate at the between-person level showed acceptable fit ($\chi^2_{[256]} = 429.22$, $p = .001$; CFI = .913; RMSEA = .034; SRMR = .054). Also, a test of factorial invariance similar to the one described above showed reasonable fit $S\text{-}B\chi^2_{[908]} = 1116.02$, $p < .001$, CFI = .939, SRMR = .095, RMSEA = .049 (90% CI: .039 - .059). Again, this finding provides some evidence that the fluctuation from game to game was not driven to large degree because of game-to-game measurement error.

Chapter 5

Do Athletes' Responses to Coach Autonomy Support and Control Depend on the Situation and Athletes' Personal Motivation?

Although plenty of studies have shown that a controlling, relative to an autonomy-supportive, motivating style yields a host of undesirable outcomes, at least some sport coaches endorse the belief that in some situations (e.g., when athletes misbehave) or with some athletes (e.g., those who are amotivated) a controlling approach is warranted and even beneficial. On the basis of Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2017), the current study examined to what extent the effects of an autonomy-supportive and controlling coaching style depend on (a) the situation at hand and (b) athletes' personal motivation. To do so, we made use of an experimental vignette–based approach. Specifically, after having completed a validated questionnaire on their motivation to practice judo (i.e., autonomous motivation, controlled motivation, amotivation), 101 judokas (67.3% boys; *M*age = 13.31 ± 1.54) were randomly assigned to either an autonomy-supportive or a controlling condition. In each condition, judokas read two comics representing distinct situations (i.e., athletes struggling with skill mastery despite their effort versus athletes not putting effort and disturbing practice), imagining themselves being the athlete in the comic. Having read the comic, athletes filled out a paper and pencil questionnaire in which they rated their anticipated need satisfaction/frustration, engagement, oppositional defiance and anger. Results showed that the situational circumstances (i.e., athletes are misbehaving) attenuated, yet, did not cancel out, some of the detrimental effects of a controlling (relative to an autonomy-supportive) approach. Effects of coaches' motivating style appeared to be largely independent of athletes' motivation. The theoretical and practical significance of the results are discussed.

Introduction

"There is no need to pressure athletes when they are struggling with hard exercises. Yet, when they are disturbing practice athletes expect their coach to punish athletes who are behaving inappropriately." (Lisa, Coach)

"Some athletes need pressure. If you don't pressure them they will not train hard enough." (Peter, coach)

These statements illustrate that at least some coaches believe that in certain situations (i.e., when athletes disturb practice) or with some athletes (i.e., those who are poorly motivated), the use of a more controlling and pressuring approach may be beneficial. Grounded in Self-Determination Theory (SDT, Ryan & Deci, 1985; 2017), a broad theory on human motivation, the main goal of this study was to examine whether the effects of a controlling (relative to an autonomy-supportive) coaching style on athletes' anticipated need-based experiences, anxiety, oppositional defiance and engagement may indeed depend on (a) the specific situational circumstances (i.e., athletes are putting effort into a hard exercise versus athletes are displaying a lack of effort and are disturbing practice) and (b) athletes' motivation (i.e., athletes being more autonomously motivated, controlled motivated, amotivated). An examination of these questions is critical from a theoretical point of view because they speak to the claim that a controlling motivating style is universally more detrimental than an autonomy-supportive style (Ryan & Deci, 2017). At the same time, these questions also have important applied value because they can provide more specific and nuanced information on which motivating style is most warranted under which circumstances and for which individuals.

Autonomy-supportive and Controlling Coaching

According to Self-Determination Theory (SDT, Deci & Ryan, 2000; Ryan & Deci, 2017), athletes are more likely to persist and thrive when their coaches rely on an autonomy-supportive style rather than on a controlling style. When being autonomy-supportive, coaches solicit athletes' needs, wishes, and preferences, they use inviting and informational language, they encourage athletes to take initiative, and they follow athletes' pace of development. When athletes show resistance, autonomy-supportive coaches acknowledge athletes' negative affect and provide a meaningful rationale for assigned tasks and requests (Mageau & Vallerand, 2003; Reeve, 2016). In contrast, when using a more controlling style, coaches are more absorbed with their own goals and ambitions, thereby enforcing their personal agenda onto the athletes. They do so by relying on a variety of pressuring strategies such as the use of commands and harsh, controlling language, the offer of contingent rewards and (threat of) punishments, the display of conditional regard and even the use of intimidation and excessive personal control (Bartholomew, Ntoumanis, Thøgersen-Ntoumani, 2010; De Meyer, Soenens, Aelterman, De Bourdeaudhuij, & Haerens, 2016).

A wealth of cross-sectional, longitudinal, and diary studies in youth sports has provided evidence that autonomy-supportive coaching relates to a host of desirable affective outcomes, including greater vitality (Adie, Duda, & Ntoumanis, 2012; Gagné, Ryan & Bargmann, 2003; Reinboth, Duda & Ntoumanis, 2004) and well-being (Haerens et al., 2018). Moreover, autonomy-supportive coaching also relates positively to behavioral outcomes such as engagement (Curran, Hill, Hall, & Jowett, 2014), sustainable persistence (Pelletier, Fortier, Vallerand, & Brière; 2001) and performance (Haerens et al., 2018). Conversely, controlling coaching relates to negative outcomes such as burnout (Balaguer et al., 2012), ill-being (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Haerens et al., 2018) and

antisocial behaviors and resentment (Chen, Wang, Wang, Ronkainen, & Huang, 2016; Delrue et al., 2017; Hodge and Lonsdale, 2011).

The systematic evidence for the differential effects of controlling and autonomy-supportive coaching on athletes' outcomes is consistent with the notion in SDT that these coaching styles appeal differentially to athletes' basic psychological needs. Autonomy-supportive coaching has been argued and shown to contribute to the satisfaction of athletes' psychological needs for autonomy (i.e., to experience a sense of volition), competence (i.e., to feel effective) and relatedness (i.e., to experience a warm relationship) (e.g., Haerens et al., 2018). In contrast, a controlling coaching style has been found to thwart athletes' psychological needs (Bartholomew et al., 2010). Because these psychological needs are considered universal, that is, to be operative and relevant to all athletes, one can assume that a perceived autonomy-supportive style is invariantly superior to a perceived controlling style in terms of fostering adolescents' motivation and well-being.

Does this universality claim imply that there is no variation whatsoever in effects of autonomy-supportive and controlling coaching? No. According to SDT, there is room for variability in the degree to which autonomy-supportive and controlling coaching affect athletes' outcomes (Deci & Ryan, 1987). While it is unlikely that a controlling style may be more adaptive than an autonomy-supportive style, the effectiveness of both styles may depend partly on the situation at hand and on athletes' personal characteristics (e.g., motivation) (Soenens, Vansteenkiste, & Van Petegem, 2015).

The Situation-Dependent Effect of Coaches' Autonomy Support and Control

In most previous correlational studies, the differential effects of autonomy-supportive and controlling coaching were investigated at a general level, thereby tapping into coaches' typical style of motivating athletes, thereby not taking the situational characteristics into account. This shortcoming was partially addressed in experimental work examining the effects of coach provided autonomy support and control in the context of a specific situation (e.g., De Muynck et al., 2017). To date, most experimental studies have focused on situations in which athletes are trying to master a specific skill. For example, in a lab study in which undergraduate students learned to master a cricket throw, participants felt more self-efficacious, reported more positive affect, and were more accurate when instructions were given in an autonomy-supportive, compared to a controlling, way (Hooyman, Wulf, & Lewthwaite, 2014). Along similar lines, kickboxers showed a greater willingness to exert their practice drills when offered the possibility to choose the order of exercises compared to when such choice was denied (Wulf, Freitas, & Tandy, 2014). Finally, tennis players involved in an experimental field study (De Muynck et al., 2017) reported more psychological need satisfaction and enjoyment and showed more behavioral perseverance when feedback was delivered in an autonomy-supportive, relative to a controlling, way.

Collectively, these experimental studies show that athletes who are practicing or even learning a new skill benefit from an autonomy-supportive approach. Yet, sport coaches do not only help athletes acquire and rehearse skills. Their role is also to monitor disciplinary matters and to intervene when athletes fail to display appropriate behavior during training (Aelterman, De Muynck, Haerens, Van de Broek, & Vansteenkiste, 2017). Both in their role to promote skill-development and to monitor disciplinary matters, coaches are from time to time confronted with challenging situations. Specifically, despite

their efforts, athletes sometimes struggle to master new skills. Also, athletes sometimes get distracted or they even show overt signs of resistance and disruptive behavior, thereby refusing to put effort into the exercises at hand.

Up until today, we are not aware of any study that addressed the potentially differential effects of autonomy-supportive and controlling coaching in these different contexts. Particularly when athletes refuse to put effort in the activity or even display disruptive behavior, coaches may be inclined to react in a more controlling way. Indeed, studies in the educational literature (Reeve, 2009) revealed that when students disengage or show disruptive behavior, teachers tend to become more controlling (e.g., Grolnick, Weiss, McKenzie, & Wrightman, 1996; Skinner & Belmont, 1993; Van den Berghe, Cardon, Tallir, Kirk, & Haerens, 2016). Teachers may react in a controlling way in these circumstances because they hold the belief that when students disengage or display disruptive behavior a controlling approach is effective and, hence, necessary (Reeve et al., 2014). Moreover, also students expect their teacher to react against disruptive behavior (Evertson & Poole, 2008), perhaps even if their reaction is controlling. Like students, athletes may appraise a controlling intervention by their coach differently as a function of the specific features of the situation at hand. As it is relatively easy and effortless to refrain from disrupting practice, athletes may find that athletes who disrupt the training should be held personally accountable for their misbehavior through a forceful intervention. Moreover, because such disruptive behavior may have consequences for other athletes (e.g., the team), athletes may conceive a forceful intervention by the coach as legitimate, thus ending up with a relatively benign interpretation of a controlling reaction of their coach. In contrast, in situations where athletes, despite of their effort-expenditure, are struggling with the exercises, a controlling coach intervention may be perceived more negatively. The used pressure may be experienced illegitimate as the lack of mastery of the exercises falls outside the control of the struggling athlete and the athlete's behavior is less disruptive for the group process.

The Role of Athletes' Personal Motivation in the Effects of Coaches' Style

Whether and how athletes are affected by autonomy-supportive or controlling coaching may depend not only on the situation at hand, but also on athletes' personal motivation. According to Self-Determination Theory (Ryan and Deci, 2017), athletes' motivation differs in terms of both quantity (motivation vs. amotivation) and quality (autonomous relative to controlled motivation). When athletes find an activity truly challenging and enjoyable (i.e., intrinsic motivation) or understand and endorse its personal value (i.e., identified regulation), they are said to be autonomously motivated. When their sport participation is driven by internal pressures such as guilt or shame (i.e., introjected regulation) or external pressures such as the threats of punishments or the offer of contingent rewards (i.e., external regulation), they display controlled motivation. When athletes lack a sense of goal directness or intentionality, when they feel aloof and they do not see the point in putting effort into the practice at hand, they are amotivated (Ryan, Lynch, Vansteenkiste, & Deci, 2011).

Most studies so far have modeled athletes' motivation as an outcome of coaches' motivating style (e.g., Haerens et al., 2018; Pelletier et al., 2001) or as a mediator in the relation between coaches' behavior and important outcomes (Healy, Ntoumanis, van Zanten, & Paine, 2014). Yet, given that there exist inter-individual differences in the amount and type of motivation that athletes bring to the sport club, athletes' motivation may also play a different role: athlete motivation may color the interpretation of the coach's motivating style and alter its effect, an idea that is consistent with the notion that individuals pro-actively interpret and shape the situation they are in (Reeve, 2013). In the literature, two hypotheses regarding the influencing role of athletes' motivation have been put forward. Specifically, the match hypothesis which is inconsistent with SDT (Deci & Ryan, 2000), involves the idea that athletes will display the most favorable outcomes when there is direct correspondence between their type of motivation and coaches' type of

motivating style (e.g., autonomous motivation-autonomy-supportive style and controlled motivation-controlling style). In contrast, according to the sensitization hypothesis (Moller, Deci, & Elliot, 2010), athletes with high-quality motivation who have a longer history of need-supportive interaction patterns, would be more sensitive to the benefits of an autonomy-supportive coaching response, while being less sensitive to the costs associated with a new controlling event. Conversely, due to their history of need-thwarting experiences, athletes with poorer motivation would be particularly sensitive to the undermining effects of new need-thwarting (e.g., controlling) events, while reaping fewer benefits from autonomy-supportive coaching.

Both hypotheses yield partly overlapping and partly diverging expectations about the moderating role of athletes' motivation in effects of coaching style. According to both hypotheses, athletes who are more autonomously motivated would benefit more from autonomy-supportive coaches. Yet according to the *match hypothesis*, athletes who are controlled motivated or amotivated would benefit more and even need more controlling coaches, while according to the *sensitization hypothesis*, athletes high on controlled motivation or amotivation, will suffer more when exposed to controlling coaching behaviors, because they will be more sensitive to it.

During the past two decades, the interplay between motivating style and personal motivation increasingly received attention in empirical work (e.g., Black & Deci, 2000; De Meyer et al., 2016; Mouratidis, Vansteenkiste, Sideridis, & Lens, 2011; Schüler, Sheldon, Prentice, & Halusic, 2014; Van Petegem et al., 2017). These studies typically focused on parents' and teachers' motivating style and yielded mixed results. Some studies provided direct (e.g., Mouratidis, 2011) or indirect (e.g., Schüler et al., 2014; Van Petegem et al., 2017) support for the overlapping premise of the match and sensitization hypotheses, showing that autonomously motivated individuals benefit more from the provision of autonomy-support. Yet, other study findings did not support this idea, revealing that the benefits derived from autonomy support were either larger for those low on autonomous motivation

(Black & Deci, 2000), or were largely independent of persons' autonomous motivation (e.g., De Meyer et al., 2016). A few studies yielded evidence for a sensitization effect. For instance, Van Petegem et al. (2017) showed that individuals with a history of need-thwarting were less sensitive to the benefits of autonomy-support. None of the studies provided support for the match hypothesis, while this hypothesis tends to hold truth in some people's lay beliefs (Ng, Thogersen-Ntoumani, and Ntoumanis, 2012; De Meyer et al., 2016).

Present Research

To examine our research questions regarding the moderating role of the situation and athletes' motivation, we chose to rely on an experimental vignette–based approach. Specifically, we developed four different vignettes in which a judo coach is interacting with two athletes, thereby crossing the style of interacting with athletes (i.e., autonomy-supportive relative to controlling) with the situation at hand. In one situation athletes were struggling, albeit putting effort into the exercises and in the other situation, they displayed a lack of effort and even disturbed the training session. We chose judo as a sport for the creation of the vignettes because its characteristics naturally align with the investigated situations. Judo is a technical sport, in which athletes are challenged to master complex skills (i.e., related to the first situation), and also has culture in which discipline is highly valued (i.e., related to the second situation) (d'Arripe-Longueville, Fournier, & Dubois, 1998). As such, this sport naturally lend itself to create both situations.

Consistent with SDT and with previous research, we generally expect that an autonomy-supportive style is more beneficial than a controlling coaching style in terms of athletes' need-based experiences, felt anger, oppositional defiance, and engagement. Yet, we anticipate that the strength of this effect may depend partly on the situation at hand and athletes' motivation.

Regarding the effect of the situational manipulation, consistent with SDT, we hypothesize that even in the disruptive situation, an autonomy-supportive approach will be more effective than a controlling style (Deci & Ryan, 1987; Ryan & Deci, 2017). Yet, we examine the possibility that the difference between an autonomy-supportive and a controlling coaching style may be less pronounced in the situation where athletes display disruptive behavior compared to the situation where they struggle mastering the exercises.

As regards judokas' personal motivation (i.e., autonomous, controlled and amotivation), two alternative sets of hypotheses can be formulated. If the match hypothesis holds true, more autonomously motivated athletes would benefit more from autonomy-supportive coaching behaviors, yet controlled or amotivated athletes would benefit more from controlling coaching. If the sensitization hypothesis holds true, athletes high on autonomous motivation would be more sensitive to and therefore also benefit more from autonomy-supportive coaching behaviors. Athletes high on controlled or amotivation would likewise be more sensitive to the coaches' behavior and thus suffer more from controlling behaviors. Given the contradictory results in previous research on this matter (De Meyer et al., 2016; Mouratidis et al., 2011; Schüler et al., 2014), we do not posit directional hypotheses. In a very explorative fashion, we also consider the possibility that the situational characteristics and athletes' personal motivation interact in their influence on the effects of autonomy-supportive (relative to controlling) coaching. For instance, the combination of the two most benign or favorable conditions (athletes in the situation struggle with a skill and the athlete's own motivation is autonomous in nature) may yield a surplus effect on the effectiveness of autonomy-supportive (relative to controlling) coaching.

Method

Participants and Procedures

A convenience sample of 101 Belgian judokas (32.7% girls) out of 20 different judo clubs participated in the current study. They were on average 13.31 years of age (*SD* = 1.54), trained on average 3.69 hours a week (*SD* = 2.06) and had on average 5.67 years (*SD* = 2.61) of experience in judo. Some judokas were approached through their coaches, with the coaches first asking permission of the judokas' parents by means of an electronic invitation distributed to the parents. If permission was obtained, a meeting with the judokas was scheduled after one of their practice sessions. Other judokas were approached directly at tournaments, and then the parents' consent towards participation was asked right away.

If parental consent was obtained, the researcher explained the format of the study to the judoka and addressed the judokas' questions (if any). During the explanation, it was ensured that judokas had every right to refrain from participating in the study, even if their parents had consented. Judokas who provided consent to participate filled out a paper-and-pencil questionnaire on their background characteristics and their general motivation to practice judo. The experimental phase was then scheduled after their next practice session, which was separated by minimum two and maximum seven days from the initial assessment. For the experiment, judokas were asked to read two comic books (one for each situation, i.e., athletes struggling with skill mastery despite their effort and athletes not displaying effort and disturbing practice), and to imagine that they were one of the two judokas in the comic book. After having read each of the two comic books, judokas filled out a paper-and-pencil questionnaire measuring their perceptions of the coach's interaction style, and their anticipated need-based experiences, as well as anticipated anger, oppositional defiance and engagement. The situations were presented in a counterbalanced manner to avoid that the sequence of the

vignettes would influence the way athletes responded to the questionnaires. Both comic books contained experimentally manipulated vignettes concerning an interaction between a judo coach and two judokas in a practice session. The coaches' response in the vignettes was presented in either an autonomy-supportive or controlling way, with judokas being randomly assigned to either an autonomy-supportive or a controlling condition. As such, a 2x2 design was created with the situational context (i.e., "struggling" versus "disruptive") representing a within-subjects factor and with condition (autonomy-supportive or controlling) representing a between-subjects factor. The study was approved by the ethical board of Ghent University.

Measures and Materials

Pre-experimental measures.

After providing information about background characteristics (i.e., gender, age, hours of training, experience, club) participants completed a validated 28-item scale (Assor, Vansteenkiste, and Kaplan, 2009) measuring their motivation to put effort into their judo practice. The stem "I put effort in training…" was followed by items to be rated on a 5-point-likert scale tapping into their intrinsic motivation (4 items; e.g., "because I find judo practice enjoyable"; $\alpha = .75$), identified regulation (4 items; e.g., "because I appreciate the advantages of judo practice"; $\alpha = .69$), introjected regulation (8 items; e.g., "because I would feel ashamed if I would not"; $\alpha = .78$), external regulation (8 items; e.g., "because I would get approval from my coach"; $\alpha = .87$) and amotivation (4 items; e.g., but I ask myself why I do it"; $\alpha = .79$). Next, a composite score was created for autonomous motivation (8 items; $\alpha = .80$) and controlled motivation (16 items; $\alpha = .88$).

Experimental manipulation.

Four different vignettes were created (see Appendix). In each of these vignettes, the behavior of the two judokas was kept constant, but the coach's responses differed across conditions, being either autonomy-supportive or controlling in nature. Specifically, in the autonomy-supportive condition, coaching behaviors consisted of acknowledging the judokas' perspective, welcoming negative affect and resistance, providing choice and a meaningful rationale, while making use of informational language. In contrast, controlling responses consisted of ignoring judokas' perspective and negative affect, demanding compliance and providing only coach-centered rationales, threatening with punishment, while using controlling, guilt/shame-inducing language. The occurrence of these autonomy-supportive and controlling behaviors were held constant across the two situations (struggling vs. disruptive), to be able to examine the effect of the same coaching behaviors in different situational circumstances. All four vignettes were reviewed by a panel of experts in SDT, judo and judo coaching to evaluate the autonomy-supportive and controlling nature, as well as the ecological validity and credibility of the coaches' responses. Based on these panel evaluations, only minor adjustments to the scenarios were made.

Manipulation check: Perceived autonomy support and control.

Judokas' perceptions of the style of the coaches' responses was assessed using items based on the Teacher As Social Context Questionnaire (TASCQ; Belmont, Skinner, Wellborn, & Connell, 1988) and the Psychologically Controlling Teaching scale (PCT; Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012), which were proven valid in the context of Physical Education (De Meyer et al., 2016). After reading the stem "If I would be one of the judokas in this training, I would have the impression that the coach…" participants answered questions probing their perception of coaches' autonomy support (6 items; e.g., "…gives me the space to do things the way I would like to do things"; $\alpha = .74$) or control (5 items; e.g., "…insists

on doing things the way s/he likes to do things": α = .38). By dropping the controlling item "…tries to change the way I see things" the reliability of scale increased to α = .52. Items were answered on a 5-point Likert scale from 1 (*not at all true*) to 5 (*completely true*).

Need satisfaction and frustration.

Needs-based experiences were assessed using a 6-item instrument based on the adapted version of the BNSFS (Chen et al., 2015). After the stem "If I would be one of the judokas in this training, I would…" participants answered to 3 items tapping into satisfaction of the needs for autonomy (i.e., "have the feeling I can be who I truly am"), competence (i.e., "have the feeling I am doing well, even with hard exercises"), and relatedness (i.e., "have the feeling that the coach truly cares about me") satisfaction (α = .76), and 3 items tapping into frustration of the needs for autonomy (i.e., "experience it as an obligation), competence (i.e., feel as a failure because of the mistake I make") and relatedness (i.e., feel excluded) (α = .61).

Affective and behavioral responses.

Anger, oppositional defiance and engagement were assessed respectively with items adopted from Assor, Roth and Deci (2004), Vansteenkiste et al. (2014) and Skinner, Kindermann, and Furrer (2009). After the stem "If I would be one of the judokas in this training, I would…" participants answered to 3 items for anticipated anger (e.g., "be very angry with my coach"; α = .78), 4 for anticipated oppositional defiance (e.g., "rebel against the expectations of my coach"; α = .78) and 6 items for anticipated engagement (e.g., "work as hard as I could"; α = .84).

Plan of Analyses

Preliminary analyses.

We first inspected descriptive statistics and Pearson correlations among all variables (see Table 1). To examine whether randomization was performed successfully, we tested through two-level (i.e., measures within athletes) multilevel regression analyses whether participants in the autonomy-supportive and controlling conditions differed according to their general background characteristics (i.e., age, hours of training, and years of experience). We used χ^2-analyses to examine gender distribution across conditions.

Primary analyses.

To address our research questions, we performed a series of two-level multilevel regression analyses with measures (i.e., for both situations), nested within athletes.[1] Then, variance components models (i.e., Model 0; Rasbash et al., 2014) were tested to estimate how much of the variance in each of the outcomes is explained at the within (i.e., Level 1) and between-athlete level (i.e., Level 2). Next, based on the preliminary analyses, we added relevant covariates (i.e., gender, age, hours of training, and years of experience) as well as experimental condition (i.e., autonomy-supportive versus controlling) to the model (See Model 1, Table 2). To examine our first research question considering the possible moderating role of the situation, we then added the main effect of situation, as well as situation by condition interaction effects to Model 1 (see Model 2, Table 2). In a similar way, and to test for the moderating role of students' motivation, we added main effects of autonomous motivation, as well as the two-way interaction terms between

[1] We did not consider a three-level model (with measures nested within athletes within coaches/clubs), because due to the recruitment procedure the distribution of participating judokas across sports clubs was very unbalanced (for 7 of the 20 clubs only one judoka was questioned).

autonomous motivation and condition to Model 1. This procedure was repeated to test the moderating role of controlled motivation and amotivation (see Table 4). Finally, in a more exploratory way we also tested for possible "condition by situation by motivation" three-way interaction effects in a full model containing three-way interaction terms as well as all possible two-way interaction effects and the main effects condition, situation, and motivation.

Results

Preliminary Analyses

Table 1 reports on the descriptive results, and the correlations between covariates and the study outcomes. Age related positively to anticipated anger and negatively to engagement. Number of training related positively to anticipated need satisfaction.

Randomization check.

Multivariate analyses showed no significant differences in judokas' age ($F(1,98) = .89$, $p = .35$), years of experience ($F(1,98) = 1.26$, $p = .27$) and hours of training ($F(1,98) = .09$, $p = .77$) according to condition. Furthermore, no differences between conditions were found for athletes' baselines scores of autonomous motivation ($F(1,98) = .90$, $p = .35$), controlled motivation ($F(1,98) = .31$, $p = .58$) and amotivation ($F(1,98) = .04$, $p = .85$).

A χ^2-analysis indicated a significant difference in sex distribution across the experimental conditions ($\chi^2(1) = 4.49$, $p < 0.05$). Specifically, the autonomy-supportive condition contained relatively more boys (58.8%) than the controlling coaching condition (41.2%), while the controlling condition contained more girls (63.6%) than the autonomy-supportive condition (36.4%).

Table 1: Bivariate correlations between all assessed variables across both the struggling and the disturbing situation

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
Covariates														
1.Age	13.31	1.54	-											
2.Training hours	3.69	2.06	.18*	-										
3.Experience	5.67	2.61	.49**	.25**	-									
Pre-Experimental														
4.Autonomous Motivation	4.28	0.50	-.17*	.15*	-.11	-								
5.Controlled Motivation	2.67	0.73	-.06	.17*	-.09	.19**	-							
6.Amotivation	1.62	0.82	-.12	.01	.01	-.42**	.17*	-						
Manipulation checks														
7.Autonomy Support	2.60	0.85	-.12	.04	-.01	.05	.09	.10	-					
8.Control	2.83	0.83	-.01	.07	-.09	.00	.08	-.06	-.44**	-				
Post-Experimental														
9.Need Satisfaction	2.63	0.90	-.09	.19**	-.03	.19**	.25**	.09	.70**	-.29***	-			
10.Need Frustration	2.77	0.95	.07	.06	-.08	-.06	.11	.04	-.43**	.48**	-.36**	-		
11.Anger	2.69	1.10	.18**	.04	.09	-.22**	.01	.11	-.60**	.44**	-.60**	.59**	-	
12.Oppositional Defiance	1.97	0.88	.05	.14	-.02	-.09	.31**	.25**	-.15*	.36**	-.03	.31**	.40**	-
13.Engagement	3.98	0.79	-.14*	-.10	-.07	.17*	-.03	-.18*	.24**	-.19**	.17*	-.25**	-.45**	-.60**

Note. $p < .05$, $^{**}p < .01$; $^{***}p < .001$.

Primary Analyses

Inspection of the variance component models revealed significant variance at the between-athlete level and at the within-athlete (between-situations) level for all outcomes. The Intraclass Correlation Coefficient (ICC; Lüdtke, Robitzsch, Trautwein, & Kunter, 2009) represents the percentage of variance lying at the between athlete-level as a proportion of the total variance. The lowest variance at the between-athlete level was found for engagement (32.85%), while the highest between-athlete variances was found for need satisfaction (56.72%). For all other of the studied variables, values were in between.

Manipulation check.

Results showed significant main effects of condition on judokas' perceptions of the coaches' autonomy-supportive and controlling style (Table 2). Judokas in the autonomy-supportive condition perceived the coach as more autonomy-supportive (M = 3.05) and less controlling (M = 2.13) compared to judokas in the controlling condition, who perceived their coach as less autonomy-supportive (M = 2.56) and more controlling (M = 3.11). These findings confirm the effectiveness of the manipulation.

Perceived credibility.

In terms of perceived credibility of the situations, no significant main effect of condition effect was found (χ^2 = 3.04, df = 1, p = 0.08). Yet, a condition by situation interaction effect emerged: the autonomy-supportive approach was perceived to be more credible than the controlling approach in the "struggling" situation (β = -0.57, χ^2 = 11.95, df = 1, $p \leq 0.001$), while no significant condition difference was found for the "disruptive" situation (β = 0.06, χ^2 = 0.12, df = 1, p = 0.73).[2]

[2] See *Note 2* in Appendix.

Table 2: Main effects of condition and condition by situation interaction effects.

PARAMETER	Autonomy Supportive Style		Controlling Style		Credibility		Need Satisfaction	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
FIXED PART	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*
Intercept	3.05 (.08)	2.90 (.10)	2.63 (.08)	2.51 (.11)	2.91 (.10)	2.92 (.12)	3.03 (.10)	3.12 (.11)
Covariates								
Gender[a]	-.01 (.12)	-.01 (.12)	-.40 (.13)**	-.40 (.13)**	.27 (.16)	.27 (.15)	.09 (.14)	.09 (.14)
Age	-.07 (.04)	-.07 (.04)	.02 (.04)	.02 (.04)	-.10 (.05)	-.10 (.05)	-.06 (.05)	-.05 (.05)
Training hours	.02 (.03)	.02 (.03)	.04 (.03)	.04 (.03)	.03 (.04)	.03 (.04)	.09 (.03)**	.10 (.03)**
Experience	.03 (.02)	.03 (.02)	-.06 (.03)*	-.06 (.03)*	.01 (.03)	.01 (.03)	.01 (03)	.01 (.03)
Predictors								
Condition[b]	-.92 (.11)***	-1.24 (.14)***	.66 (.12)***	.80 (.16)***	-.25 (.14)	-.57 (.17)**	-.87 (.13)***	-1.10 (.16)***
Situation[c]		-.29 (.12)*		.25 (.14)		-.02 (.11)		-.19 (.11)
Condition[b] * Situation[c]		.64 (.18)***		-.27 (.20)		.63 (.16)***		.45 (.16)**
RANDOM PART REFERENCE MODEL	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Athlete level variance	.26 (.07)	.06 (.05)	.18 (.07)	.08 (.06)	.29 (.08)	.27 (.07)	.42 (.09)	.24 (.06)
Repeated Measure level variance	.44 (.06)	.43 (.06)	.50 (.07)	.50 (.07)	.41 (.06)	.41 (.06)	.35 (.05)	.35 (.05)
RANDOM PART TEST MODEL	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Athlete level variance	.06 (.05)	.09 (.05)	.08 (.06)	.08 (.06)	.27 (.07)	.32 (.07)	.24 (.06)	.25 (.06)
Repeated Measure level variance	.43 (.06)	.38 (.05)	.50 (.07)	.48 (.07)	.41 (.06)	.32 (.05)	.35 (.05)	.32 (.05)
Test of significance								
IGLS Deviance reference model	476.57	423.30	479.51	452.42	473.22	470.22	476.62	441.11
IGLS Deviance test model	423.30	410.78	452.42	449.28	470.22	445.20	441.11	433.29
X^2 *(df)*	53.27 (5)***	12.52 (2)**	27.09 (5)***	3.14 (2)	3.00 (5)	25.02 (2)***	35.51 (5)***	7.82 (2)*

Note. *p < .05; **p < .01; ***p < .001. Values in parentheses are standard errors.

[a]Gender reference category = boy; [b] Condition reference category = autonomy supportive; [c] Situation reference category = struggling.

Table 2 continued.

PARAMETER	Need Frustration		Anger		Engagement		Defiance	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
FIXED PART	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*
Intercept	2.41 (.10)	2.37 (.12)	2.23 (.10)	2.07 (.13)	4.13 (.09)	4.26 (.11)	1.87 (.10)	1.72 (.12)
Covariates								
Gender[a]	-.17 (.14)	-.17 (.14)	-.32 (.16)*	-.33 (.16)*	.16 (.13)	.16 (.13)	-.34 (.15)*	-.35 (.15)*
Age	.08 (.05)	.08 (.05)	.12 (.05)*	.12 (.05)*	-.07 (.05)	-.07 (.04)	.04 (.05)	.04 (.05)
Training hours	.04 (.03)	.04 (.03)	.01 (.04)	.01 (.04)	-.03 (.03)	-.04 (.03)	.07 (.03)*	.07 (.03)*
Experience	-.08 (.03)**	-.08 (.03)**	-.02 (.03)	-.02 (.03)	.02 (.03)	.02 (.03)	-.04 (.03)	-.04 (.03)
Predictors								
Condition[b]	.85 (.13)***	1.15 (.17)***	1.15 (.14)***	1.55 (.19)***	-.41 (.12)**	-.52 (.15)**	.42 (.14)**	.64 (.17)***
Situation[c]		.07 (.14)		.33 (.17)*		-.26 (.13)*		.30 (.14)*
Condition[b] * Situation[c]		-.61 (.20)**		-.79 (.24)**		.20 (.18)		-.43 (.20)*
RANDOM PART REFERENCE MODEL	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Athlete level variance	.29 (.09)	.12 (.07)	.40 (.12)	.09 (.09)	.18 (.06)	.14 (.06)	.24 (.08)	.20 (.07)
Repeated Measure level variance	.58 (.08)	.59 (.08)	.77 (.11)	.77 (.11)	.42 (.06)	.43 (.06)	.50 (.07)	.50 (.07)
RANDOM PART TEST MODEL	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Athlete level variance	.12 (.07)	.15 (.07)	.09 (.09)	.13 (.08)	.14 (.06)	.15 (.06)	.20 (.07)	.21 (.07)
Repeated Measure level variance	.59 (.08)	.52 (.07)	.77 (.11)	.69 (.10)	.43 (.06)	.41 (.06)	.50 (.07)	.48 (.07)
Test of significance								
IGLS Deviance reference model	526.77	492.95	583.43	534.48	451.24	440.97	489.57	480.76
IGLS Deviance test model	492.95	479.97	534.48	523.47	440.97	436.79	480.76	475.36
X^2 *(df)*	33.82 (5)***	12.98 (2)**	48.95 (5)***	11.01 (2)**	10.27 (5)	4.18 (2)	8.81 (5)	5.40 (2)

Note. $*p < .05$; $**p < .01$; $***p < .001$. Values in parentheses are standard errors.

[a]Gender reference category = boy; [b] Condition reference category = autonomy supportive; [c] Situation reference category = struggling.

Main effects of coaching style.

Judokas anticipated more need satisfaction (χ^2 = 42.54, *df* = 1, $p \leq$ 0.001) and engagement (χ^2 = 10.89, *df* = 1, p = 0.001), and less need frustration (χ^2 = 40.77, *df* = 1, $p \leq 0.001$), anger (χ^2 = 63.29, *df* = 1, $p \leq 0.001$), and defiance (χ^2 = 9.22, *df* = 1, $p \leq 0.01$) when they read the autonomy-supportive vignettes when compared to the controlling vignettes (see Table 2).

The moderating effect of situation.

Next, we examined condition by situation interaction effects in relation to the outcomes. For all but one outcome (i.e., engagement), we found significant condition by situation interaction effects. Significance levels ranged between χ^2 = 11.34, *df* = 1, $p \leq 0.001$ for anger and χ^2 = 4.66, *df* = 1, $p \leq 0.05$ for oppositional defiance. For anticipated need satisfaction, a controlling approach elicited less need satisfaction in both situations, yet the detrimental effects were stronger for the "struggling" situation (β = -1.10, χ^2 = 49.49, *df* = 1, $p \leq 0.001$), when compared to the "disruptive" situation (β = -.65, χ^2 = 17.29, *df* = 1, $p \leq 0.001$). Similar, yet opposite, effects were found for anticipated need frustration and anger. While a controlling approach elicited more anticipated need frustration and anger in both situations, the detrimental effect of a controlling approach appeared larger in the "struggling" situation (β = 1.15, χ^2 = 46.81, *df* = 1, $p \leq 0.001$ for need frustration; β = 1.55, χ^2 = 68.56, *df* = 1, $p \leq 0.001$ for anger), when compared to the "disruptive" situation (β = .55, χ^2 = 10.68, *df* = 1, p = 0.001 for need frustration, β = .75, χ^2 = 16.42, *df* =1, $p \leq 0.001$ for anger). As for judokas' anticipated oppositional defiance, we found that only for the "struggling" situation, athletes anticipated more defiance when exposed to a controlling coach (β = .64, χ^2 = 13.94, *df* = 1, $p \leq 0.001$), while in "disruptive" situation no differences were found between an autonomy-supportive and controlling approach (β = .22, χ^2 = 1.59, *df* = 1, p = 0.21). All averages are reported in Table 3.

Table 3: Means and standard deviations according to condition and situation.

	Situation Struggling-Effort	Situation Disturbing-Lack of effort
	B0 (S.E.)	*B0 (S.E.)*
Autonomy Support		
Autonomy Support	3.20 (.10)	2.91 (.10)
Controlling	1.96 (.11)	2.31 (.11)
Controlling		
Autonomy Support	2.51 (.11)	2.75 (.11)
Controlling	3.31 (.12)	3.28 (.12)
Credibility		
Autonomy Support	2.92 (.12)	2.91 (.12)
Controlling	2.35 (.13)	2.96 (.13)
Need Satisfaction		
Autonomy Support	3.12 (.11)	2.94 (.11)
Controlling	2.02 (.13)	2.29 (.13)
Need Frustration		
Autonomy Support	2.37 (.12)	2.44 (.12)
Controlling	3.53 (.13)	2.99 (.13)
Anger		
Autonomy Support	2.07 (.13)	2.39 (.13)
Controlling	3.61 (.15)	3.15 (.15)
Engagement		
Autonomy Support	4.26 (.11)	4.00 (.11)
Controlling	3.75 (.12)	3.69 (.12)
Defiance		
Autonomy Support	1.72 (.12)	2.02 (.12)
Controlling	2.36 (.14)	2.23 (.14)

The moderating effect of judokas' motivation.

Next, we examined motivation (i.e., autonomous, controlled and amotivation) by condition interaction effects in relation to the outcomes. Of the 15 interaction terms tested (3 types of motivation by 5 outcomes) only two were significant (See Table 4, i.e., with autonomous motivation and amotivation), and both were in the prediction of need satisfaction. A test of simple slopes indicated that athletes reported less need satisfaction when they were exposed to the controlling coach as compared to the autonomy-supportive coach, especially when they were high (i.e., +1 *SD* above the mean)

in autonomous motivation (β = -1.21, *SE* = 0.20, *z* = -6.16, *p* < .01) or low in amotivation (β = -1.17, *SE* = 0.20, *z* = -5.96, *p* < .01). The respective difference between the controlling and autonomy supportive approach was smaller among athletes who were around the mean in autonomous motivation (β = -0.86, *SE* = 0.13, *z* = -6.60, *p* < .01) and amotivation (β = -0.87, *SE* = 0.12, *z* = -7.07, *p* < .01), and even smaller – yet still statistically significant - among those who were low (i.e., -1 *SD* below the mean) in autonomous motivation (β = -0.51, *SE* = 0.14, *z* = -3.69, *p* < .01) or high in amotivation (β = -0.57, *SE* = 0.19, *z* = -3.06, *p* < .01). A graphical representation of both interactions is shown in Figure 1 and 2.

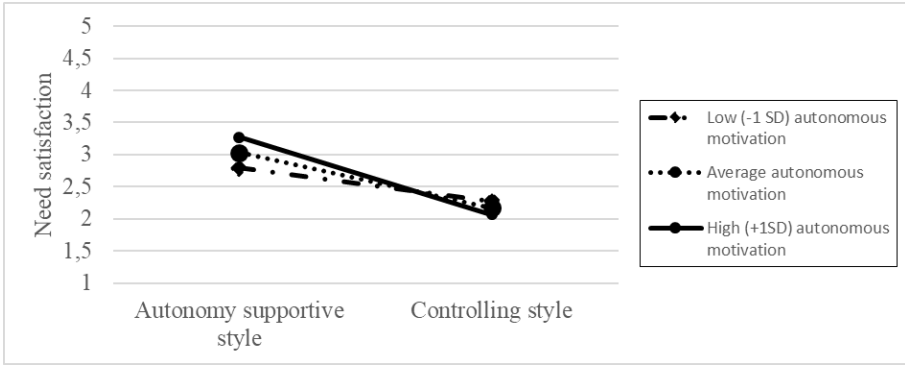

Figure 1: Graphical representation of the condition by autonomous motivation interaction effect in the prediction of need satisfaction.

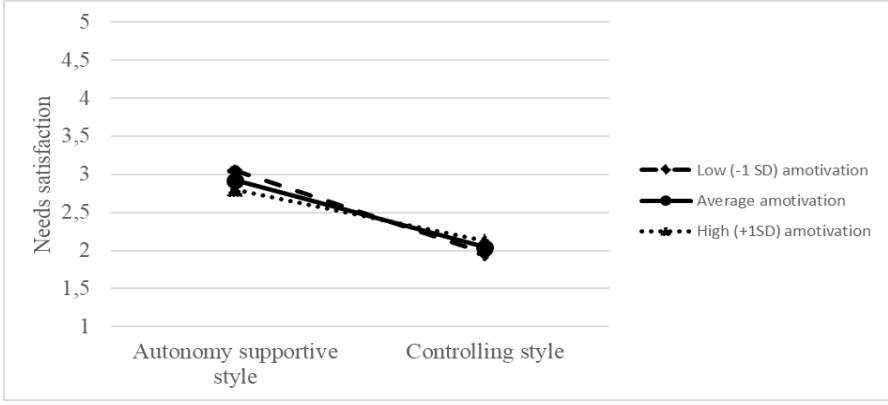

Figure 2: Graphical representation of the condition by amotivation interaction effect in the prediction of need satisfaction.

In terms of main effects of motivation, we found that judokas who were more autonomously motivated, anticipated more engagement (β = .25, χ^2 = 4.10, *df* = 1, $p \leq 0.05$) and less anger (β = -.34, χ^2 = 5.97, *df* = 1, $p \leq 0.05$), while no significant relationships with anticipated need satisfaction, need frustration or defiance were found. Judokas high on controlled motivation anticipated more need satisfaction (β = .26, χ^2 = 8.54, *df* = 1, $p \leq 0.01$) and more oppositional defiance (β = .34, χ^2 = 13.78, *df* = 1, $p \leq 0.001$), yet no significant relations with other outcomes were found. Judokas higher on amotivation anticipated less engagement (β = -.17, χ^2 = 5.75, *df* = 1, $p \leq 0.05$) and more oppositional defiance (β = .27, χ^2 = 11.23, *df* = 1, $p \leq 0.001$), yet none of the other relations were significant.

Finally, we also explored whether there were significant "condition by situation by motivation" three-way interaction effects. None of these three-way interaction effects appeared significant (all $\chi^2 < 3.49$, *df* = 1, $p > 0.06$).

Table 4: Condition by motivation interaction effects.

	Autonomous motivation	Controlled motivation	Amotivation
	Motivation*Condition	Motivation*Condition	Motivation*Condition
	B (S.E.)	*B (S.E.)*	*B (S.E.)*
Autonomy Support	-.05 (.22)	.24 (.14)	.12 (.13)
Controlling	-.26 (.23)	-.30 (.16)	-.21 (.14)
Need Satisfaction	-.70 (.25)**	.06 (.17)	.36 (.16)*
Need Frustration	-.34 (.26)	.04 (.18)	.03 (.16)
Anger	.36 (.27)	.06 (.19)	-.12 (.17)
Engagement	-.06 (.24)	.07 (.17)	-.02 (.15)
Defiance	.18 (.27)	.05 (.18)	.08 (.16)

Note. Tested in a model including covariates and main effects of motivation and condition.

Discussion

Recent SDT-based research has shown that an autonomy-supportive and controlling coaching style are on average, respectively, beneficial and harmful for athletes' experiences, motivation, engagement, and performance (e.g., Wulf, 2007). Consistent with this research, results of the current study demonstrate that an autonomy supportive, relative to a controlling, style predicts more need satisfaction and more engagement and less need frustration, anger, and oppositional defiance. Our findings thus corroborate the average adaptive effect of an autonomy-supportive coaching style.

Yet, some sport coaches raise doubts about whether in real life an autonomy-supportive coaching style would always, that is, under all circumstances and with any athlete, yield desirable outcomes (e.g., Ng, Thøgersen-Ntoumani, & Ntoumanis, 2012). That is, some coaches hold the belief that in some situations (e.g., when athletes display disruptive behavior) and with some athletes (i.e., those high on controlled motivation or amotivation) a controlling approach is warranted and even more effective (Ng et al., 2012). While the idea that a controlling approach would sometimes be more effective than an autonomy-supportive approach, is inconsistent with SDT's universality claim, SDT acknowledges that there might be gradation in the beneficial and harmful effects of an autonomy-supportive and controlling style (Deci & Ryan, 1987; Ryan & Deci, 2017; Soenens et al., 2015), depending on both contextual and person characteristics (Van Assche, Van der Kaap-Deeder, Audenaert, De Schryver, & Vansteenkiste, in press). Yet, to date, this issue of gradation did not receive much attention in the context of sports. Therefore, the current study examined whether the anticipated beneficial and harmful effects of, respectively, an autonomy-supportive and controlling coaching style depend on (a) the situation at hand and (b) athletes' personal motivation.

Situation-dependency of Coach Autonomy Support and Control

The detrimental effects of a controlling approach appeared to be more pronounced in a situation where athletes are struggling albeit putting effort into the exercises when compared to a situation where athletes display disruptive behavior. Thus, when athletes envisioned a judoka who was approached by a controlling coach while struggling with the exercises (e.g., "just do as I say, it is not so hard"), they anticipated the least need satisfaction and the most need frustration, they indicated they would experience more anger and resentment and are more likely to defy the request of the controlling coach all together. This was very different when the coach was holding an autonomy-supportive approach (e.g., "it is indeed not an easy exercise") in the "struggling" situation. Then, athletes anticipated that they would experience high levels of autonomy (i.e., a sense of volition), competence (i.e., effective) and relatedness (i.e., warm relationship) satisfaction (with scores higher than 3 on a five-point scale) and low levels of autonomy (i.e., pressured), competence (i.e., failure) and relatedness (i.e., cold relationship, excluded) frustration (with scores of 2 on a five point scale).

In a situation where athletes display disruptive behavior, the controlling approach (e.g., "if I must say it another time, you will get punished") was also detrimental (when compared to an autonomy-supportive approach) in terms of anticipated need satisfaction, need frustration, and anger. Yet, the effect was more modest in terms of effect size than in the struggling situation.

While the situation at hand thus seems to attenuate the detrimental effects of a controlling approach, it is important to note in both situations an autonomy-supportive approach elicited more engagement than a controlling one and that even in the disruptive situation the autonomy supportive reaction was still more adaptive for most outcomes (except for oppositional defiance). As such, the current results demonstrate that the situational circumstances in which such coaching behaviors are displayed, only partially modify the extent

to which these coaching behaviors influence judokas' anticipated experiences during practice.

How can this attenuating effect of the situation be explained? Studies in the educational literature show that teachers are pulled to act in a more controlling way when students misbehave (e.g., Grolnick et al., 1996; Skinner and Belmont, 1993; Van den Berghe et al., 2016). As such, a controlling reaction might come across as more normative, realistic and familiar in such a situation (Reeve et al., 2014). Our results provided some indirect support for this interpretation as athletes rated the controlling approach as more credible in the disruptive behavior compared to the struggling situation. Athletes may also have found such a demanding and more forceful response of the coach to be a bit more legitimate and therefore less harmful (Way, 2011). After all, judokas have control over the amount of effort they display and the extent to which they engage disruptive behavior. As such, they can be held accountable for their behavior in this situation. This is different when athletes are struggling with exercises. In this situation athletes may feel as if their lack of competence falls outside their control, and they may therefore feel not understood by a controlling coach. In their opinion, the controlling coach may fail to notice their efforts to master the activity and the fact of being considered personally accountable for making insufficient progress may even come across as intrusive. For this reason, the use of control under these circumstances may be perceived as less legitimate and, therefore, more harmful.

The Motivation-dependency of Coach Autonomy Support and Control

In addition to considering the role of the situation at hand, we also investigated whether athletes' motivation moderated the effect of coaches' style. The results revealed that the effects of coaching style were largely independent of judokas' personal motivation (with only two out of 15 interactions being significant). Further inspection of the two interaction

effects showed that they both concerned need satisfaction and were a matter of gradation. That is, the difference between the autonomy supportive and controlling vignette in the prediction of need satisfaction was more pronounced for judoka's high in autonomous motivation and low in amotivation. Specifically, highly autonomously motivated and lowly amotivated anticipated even more need satisfaction in response to an autonomy-supportive approach and even less need satisfaction in reaction to a controlling approach compared to individuals low in autonomous motivation or high in amotivation.

Thus, athletes' motivation affected the degree to which an autonomy-supportive (relative to a controlling) approach elicited need satisfaction. In none of both interactions, the conditions effects were cancelled, let alone reversed. Together, these findings suggest, in contrast to some coaches' beliefs regarding the motivation-dependent effectiveness of an autonomy-supportive or controlling approach (e.g., Ng et al., 2012), that the moderating role of athletes' motivation was rather limited. Our findings also do not support the idea that a match between athletes' motivation and coaches' motivating style is warranted as has been suggested in previous research (Horn, Bloom, Berglund & Packard, 2011; Schüler et al., 2016), as athletes high on controlled motivation or amotivation did not benefit more from a controlling approach. Neither do our results provide systematic support for the mechanism of sensitization that received some support in prior research with teachers and parents (e.g., Van Petegem et al., 2017). If the sensitization hypothesis would have been supported we would have found that athletes who were highly autonomously motivated, or lowly amotivated would not only be more sensitive to an autonomy supportive approach but also be less sensitive to the detrimental effects of a controlling approach, while athletes low on autonomous motivation or high on amotivation with a history of need-thwarting events would have been particularly sensitive to the undermining effects of new controlling events. Our results supported only the former part of the hypothesis but not the latter part.

Although the number of moderation effects was limited, such findings are informative in their own right. Indeed, the claimed universal benefits of a perceived autonomy-supportive coaching style begs the question of moderation by individual differences variables, an issue that has received increasing attention over the past few years (Vansteenkiste & Mouratidis, 2016). A host of potential moderators have been addressed in recent work, varying from personality differences (e.g., Hagger & Chatzisarantis, 2011; Mabbe, Soenens, De Muynck, & Vansteenkiste, 2018), to differences in need strength (e.g., Katz et al., 2010; Schüler et al., 2014; Van Assche et al., in press) and differences in motivation (e.g., De Meyer et al., 2016). Congruent with previous work by De Meyer et al. (2016), herein, limited evidence was found for the moderating role of athletes' type of motivation in the relationship between coaches' autonomy-supportive and controlling behaviors and athletes' sport experience. Interpreted differently, our findings suggest that an autonomy-supportive approach will most likely yield adaptive outcomes, and that a controlling approach will most likely lead to detrimental outcomes, even if athletes are controlled motivated or amotivated.

Finally, our findings also revealed some direct relationships between athletes' motivation and the outcomes. Irrespective of the coaching style they were exposed to, athletes who truly enjoyed or valued practicing judo (high on autonomous motivation) and who do not feel aloof at all (low on amotivation) anticipated higher levels engagement. Moreover, when athletes truly enjoyed and valued practicing judo, they anticipated less anger. Further, athletes who were highly controlled motivated or amotivation, anticipated more oppositional defiance. These findings suggest that these trait levels of motivation, which are likely to be rooted in a history of need satisfying (as for autonomous motivation) and need frustrating (as for amotivation) experiences determine to some extent (not systematically for all outcomes) how athletes respond to experimentally manipulated vignettes of a coaching situation. Surprisingly, and not in line with SDT, we found that athletes who were more controlled motivated, and were thus driven by internal (e.g., shame, guilt) or

external (e.g., punishments, threats) pressures, anticipated more need satisfaction. To better understand this unexpected positive relationship, we investigated in a set of supplementary analyses whether relations remained significant when controlling for the degree to which athletes were autonomously motivated and amotivated, which was not the case, suggesting that part of the positive relation was due to the shared variance between autonomous motivation and controlled motivation, which were positively correlated in the current study ($r = .19$, $p < .01$).

Practical Implications

In light of the consistent finding regarding the benefits of an autonomy-supportive motivating style, an increasing number of researchers have developed and tested evidence-based interventions to train sport coaches to adopt a more autonomy supportive style (e.g., Reynders et al., 2018). In one study with Paralympic athletes, it was even shown that coaches who were trained to become more skilled in autonomy-supportive coaching had athletes who obtained a greater number of Olympic medals (Cheon, Reeve, Lee, & Lee, 2015). During professional training programs, coaches often raise doubts about whether in real life an autonomy-supportive style is always attainable, realistic and effective (e.g., Aelterman et al., 2013), and coaches particularly struggle to act in an autonomy-supportive way when athletes are fooling around, are disrupting practice, or display a lack of effort. In such situations, a strong reaction is called for. Yet, in such circumstances, coaches do often more than simply reminding athletes of the introduced rules and guidelines. This is because expectations are brought to their attention in a fairly forceful fashion by using commands (e.g., “It is enough, you must…”), by threatening with sanctions (e.g., “If I need to say it another time, then…) or by punishing (e.g., “you must sit aside now). Although coaches may hope to reorient athletes’ attention to the exercise and to prompt them to extra efforts with such a forceful approach they may end up with athletes who don’t feel understood,

as indexed by lowered need satisfaction, and who may even resist complying with the coaches' request, as indexed by the elevated anger, resentment and oppositional defiance.

So, what is the alternative? Clearly, becoming permissive under these circumstances and hoping that the situation resolves itself is out of question. Yet, the way of intervening seems to play a major role. In the present study, the coaches in the autonomy-supportive vignette asked questions (e.g., "you seem to have problems to concentrate, how come?"), acknowledged athletes' negative affect and provided a rationale (e.g., "I understand it is not easy to concentrate if you do not like this exercise too much, yet this exercise will help you with the next exercise…"), and even provided choice (e.g., "you can choose, either you choose a different partner or you keep on working together and take the exercise seriously") to defuse the problematic situation. Although some coaches may consider such an autonomy-supportive approach as being "too soft" to adequately handle disruptive behavior, the current results indicate the opposite. Hence, the challenge for coaches is to consequently follow up on athletes' disruptive behavior, yet do so in an autonomy-supportive way. Indeed, past research, albeit not specifically related to athletes' disruptive behavior, has found that the combination of an autonomy-supportive style with the provision of structure is most ideal to promote engagement and autonomous motivation (Curran, Hill, & Niemic, 2013; Jang, Reeve, & Deci, 2010; Vansteenkiste et al., 2012).

When athletes are struggling with hard exercises, coaches' patience to follow athletes' pace of development may be quite challenging. In such a situation it appears even more important to refrain from controlling strategies such as the use of controlling language (e.g., "I see you are making the same mistake over and over again, you must…."), pressuring athletes (e.g., "if others manage, you have to as well") or shaming them (e.g., "stop now, there is no point in proceeding like this"). Indeed, given the benefits of an autonomy-supportive approach were even more pronounced in this situation, coaches do well to maintain this style when athletes invest a lot of effort into

hard exercises they are struggling with. As such, an autonomy-supportive style seems to help athletes stay positive and engaged when facing challenging or even competence-frustrating situations.

Finally, the results of the current study suggest that coaches should not pursue an absolute match between their motivating style and athletes' motivation, as if an autonomy-supportive approach would only work for autonomously motivated athletes, while a controlling approach would be effective for athletes with poor quality motivation (i.e., controlled motivation and amotivation). Instead, based on the results of the experiment presented here, it can be hypothesized that, also in real-life, all athletes would thrive under autonomy-supportive conditions and suffer from controlling strategies. We would like to caution, however, that the current findings do not suggest that an autonomy-supportive style represents a motivational cook book, including recipes that work all the time for all athletes. An autonomy-supportive style in essence requires coaches to adopt a curious and receptive attitude as to fully understand the athletes' frame of reference (Aelterman et al., 2017; Vansteenkiste & Soenens, 2015). Autonomy-supportive coaches flexibly adapt their strategies to the athletes in front of them, in an attempt to identify, nurture, and develop their inner motivational resources. Indeed, such an empathic stance is perhaps the most central feature of an autonomy-supportive style (Mageau, Sherman, Grusec, Koestner, & Bureau, 2017; Soenens, Deci, & Vansteenkiste, 2017; Vansteenkiste, Niemiec, & Soenens, 2010).

Limitations and Future Directions

Some limitations of the current study require attention. First, due to the repeated measurement design, the number of items per construct were limited as to avoid response fatigue among participants. The limited set of items reduced the internal consistency of some of the assessed constructs. Second, the vignettes used to standardize participants' exposure to autonomy-

supportive or controlling coaching behavior were very different and may not correspond with daily reality. In real-life many coaches rely on a mixture of strategies (e.g., Haerens et al., 2018), alternating between more autonomy-supportive and more controlling strategies within a situation. The pronounced difference between the two conditions not only account for strong condition effects, this difference may also have reduced the probability of obtaining evidence for the moderating role of the situation and athletes' motivation. These moderating variables may play a more significant role in more ambiguous situations, involving a combination of both styles. Future studies could include a more ambiguous situation involving a mixture of both autonomy-supportive and controlling coach reactions. Third, although the use of written vignettes has its advantages (e.g., no interference of body language or intonation), because we assessed students' hypothetical responses to the vignettes we cannot tell with certainty whether they would feel and respond the same way in an actual training. Also, written vignettes are less vivid than interactions put in scene and presented via video demonstration (e.g., De Meyer et al., 2016). As such, they rely heavily on participants' imagination and access to anticipated emotions and behavior. In future work one could also try to address our research questions by manipulating sport coaches' style in a real-life context and by assessing athletes' real-life responses and feelings (e.g., Mouratidis et al., 2011).

Conclusion

Coaches do not only help athletes to develop skills, they also have an important role to monitor disciplinary matters and to regulate athletes' appropriate behavior during training. Moreover, from time to time they also deal with athletes who are less optimally motivated. The current study addressed the question whether in disciplinary situations, or with poorly motivated athletes, a controlling approach may be warranted. Although we found that the differences between the autonomy-supportive and controlling

approaches were less pronounced in situations where athletes disrupt the training compared to situations where athletes struggle to master a skill, results showed that neither the situational circumstances (e.g., athletes are misbehaving), nor athletes' personal motivation (e.g., they are more controlled motivated or amotivated) cancelled out the benefits of an autonomy supportive, relative to a controlling, approach. These findings provide further support for the theoretical claim that a controlling motivating style is universally more detrimental then an autonomy-supportive style (Ryan & Deci, 2017). Although disrupting athletes or poorly motivated athletes may pull a controlling approach from coaches, the present findings suggest that even under these more challenging circumstances coaches would do well to adopt an autonomy- supportive stance.

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Appendix

***Note 2*.**

There were also two condition by motivation (i.e., controlled motivation, amotivation) interaction terms in the prediction of credibility. A test of simple slopes indicated that athletes reported less credibility when they were exposed to the controlling as compared to the autonomy-supportive condition, provided they were low (i.e., +1 *SD* below the mean) in controlled motivation (b = -0.43, SE = 0.18, z = -2.37, $p < .01$) or amotivation (b = -0.55, SE = 0.17, z = -3.24, $p < .01$). The respective difference was marginal among athletes who were around the mean in controlled motivation (b = -0.26, SE = 0.14, z = -2.37, p = .073) or amotivation (b = -0.25, SE = 0.14, z = -1.76, p = .079), and nonsignificant among athletes who were high (i.e., +1 *SD* above the mean) in controlled motivation (b = -0.09, SE = 0.15, z = -0.59, p = .56) or amotivation (b = 0.05, SE = 0.14, z = 0.36, p = .71). Although not a central aim of this study, these findings are interesting because they suggest that students with more maladaptive motivation (who are likely to have been exposed more often to controlling environments) perceive new controlling events as equally credible as autonomy-supportive events. Perhaps because of their developmental history they have developed the expectation that controlling events are as likely as autonomy-supportive events.

Experimental Vignettes.

1.Autonomy-supportive style - Struggling situation

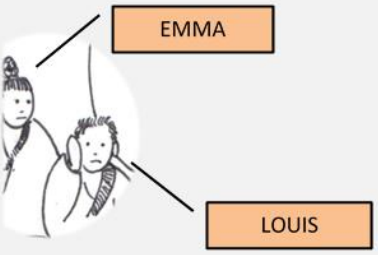
Below you find a short story, which is situated at judo practice. Try to project yourself as good as you can in the depicted situation. **Imagine that you were present in this practice session and you were one of the two judokas.** Afterwards, please fill in the questionnaire.

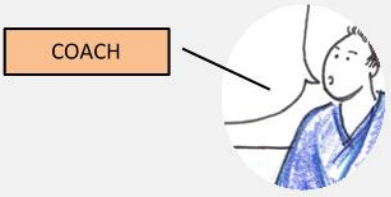
Emma and Louis are both members of judo club ***Wasa Hari.*** They both have an orange belt and are 12 years of age. From early on they have been coached by the coach. Practice is judo club *Wasa Hari* is on Tuesday and Friday evening. Emma and Louis are almost always present. Most of the times they practice on each other, but sometimes with the other judokas as well.

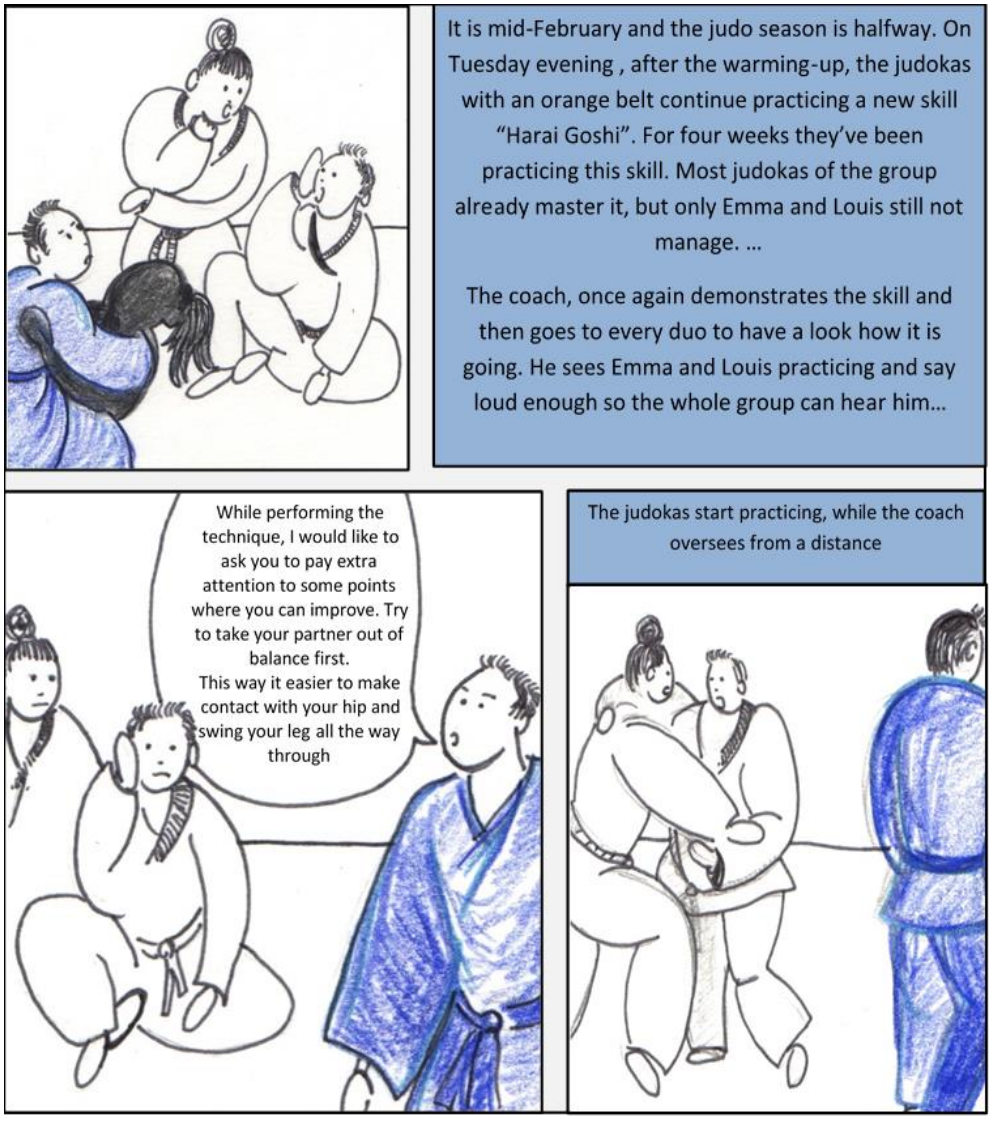
Emma practices judo since she was 7. She started because her older brother is a judoka as well. All her friends do dance class, but Emma would rather do Judo.

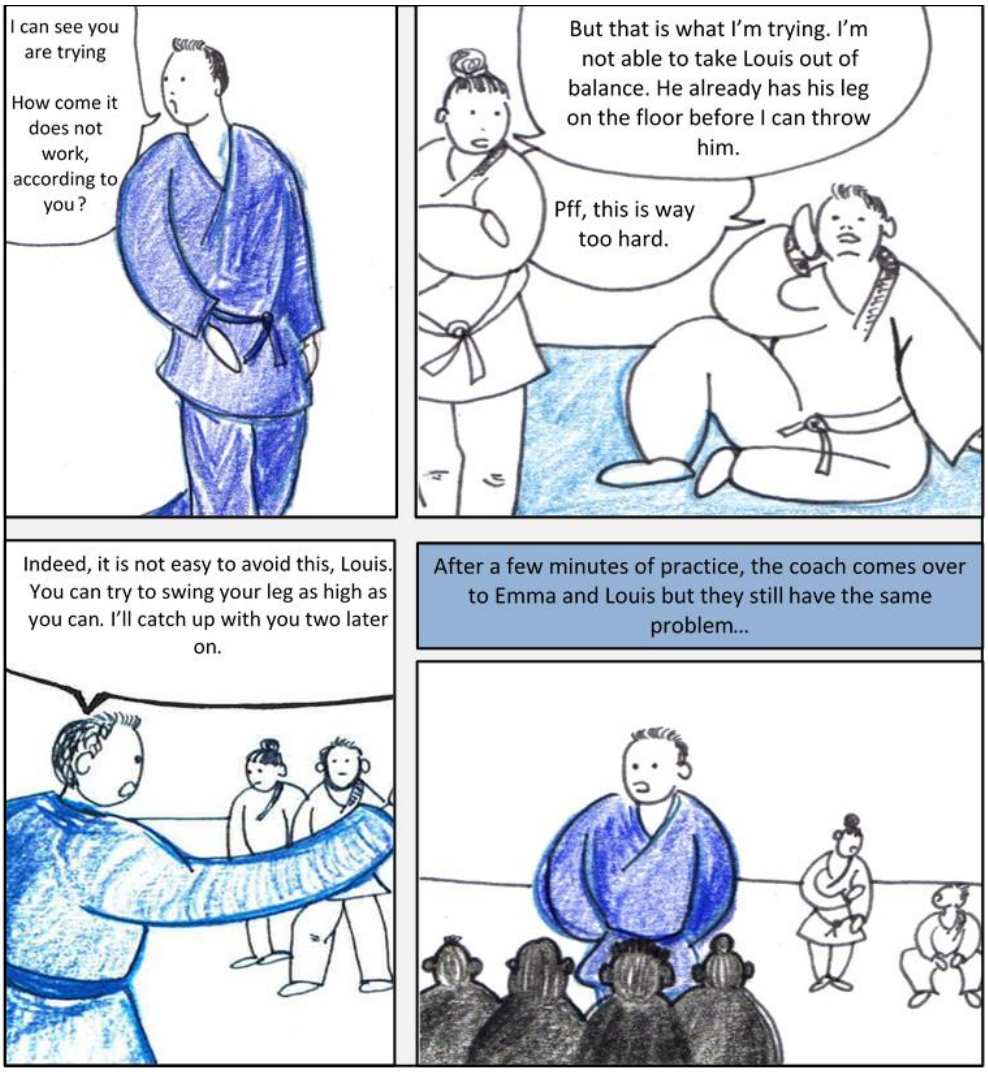
Louis practices judo since he was 8. He started after watching a judo tournament on television. He was very impressed and thought the judokas looked tough.

It is mid-February and the judo season is halfway for the judokas.






It is mid-February and the judo season is halfway. On Tuesday evening , after the warming-up, the judokas with an orange belt continue practicing a new skill "Harai Goshi". For four weeks they've been practicing this skill. Most judokas of the group already master it, but only Emma and Louis still not manage. …
The coach, once again demonstrates the skill and then goes to every duo to have a look how it is going. He sees Emma and Louis practicing and say loud enough so the whole group can hear him…
While performing the technique, I would like to ask you to pay extra attention to some points where you can improve. Try to take your partner out of balance first.
This way it easier to make contact with your hip and swing your leg all the way through
The judokas start practicing, while the coach oversees from a distance

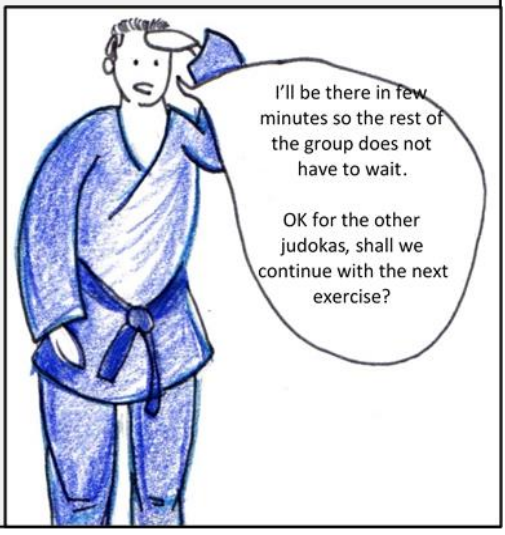

I can see you are trying
How come it does not work, according to you ?
But that is what I'm trying. I'm not able to take Louis out of balance. He already has his leg on the floor before I can throw him.
Pff, this is way too hard.
Indeed, it is not easy to avoid this, Louis. You can try to swing your leg as high as you can. I'll catch up with you two later on.
After a few minutes of practice, the coach comes over to Emma and Louis but they still have the same problem…

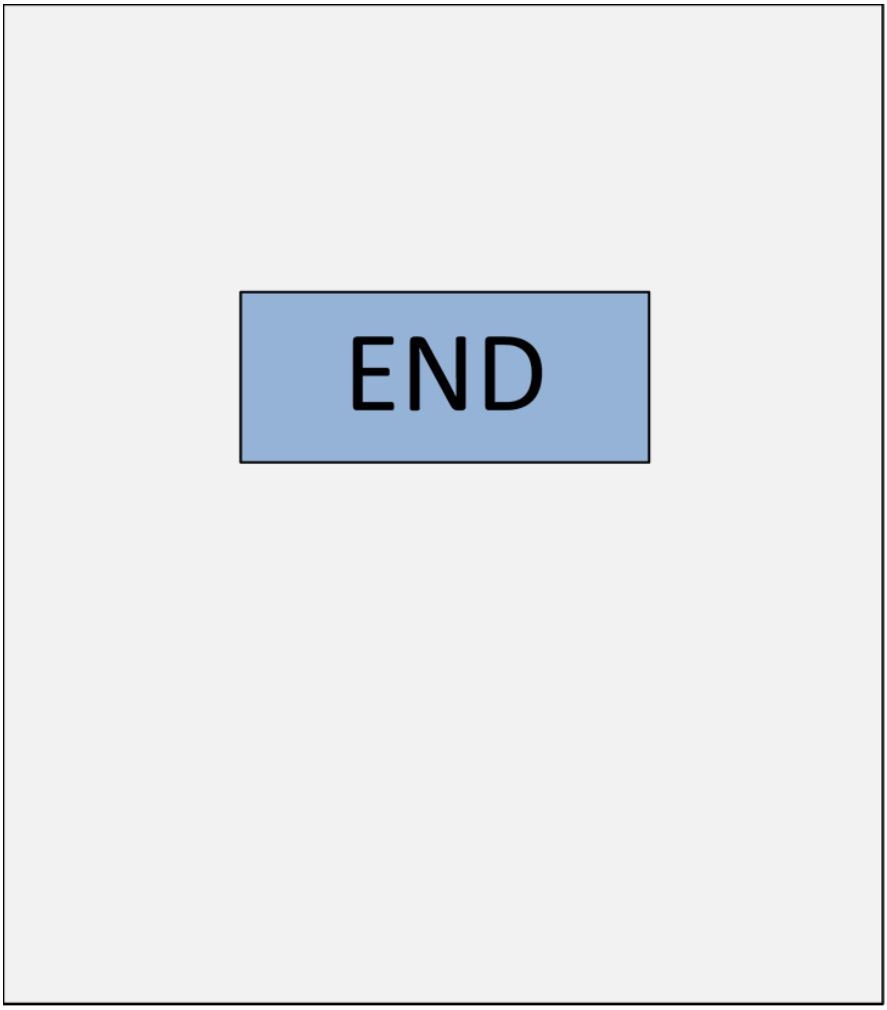
The coach turns to Emma and Louis and says loud enough so the whole group can hear him…

I see two possibilities:
or you can try a simpler version of this exercise, or you can try the same exercise with a different partner.

…and says loud enough so the whole group can hear him…

Meanwhile the other judokas were finished with the exercise, standing around doing nothing. The coach again turns to Emma and Louis…

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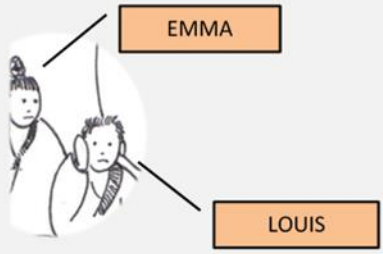
2.Autonomy-supportive style – Disrupting situation

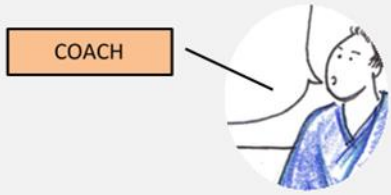
Emma and Louis are both members of judo club ***Wasa Hari.*** They both have an orange belt and are 12 years of age. From early on they have been coached by the coach. Practice is judo club *Wasa Hari* is on Tuesday and Friday evening. Emma and Louis are almost always present. Most of the times they practice on each other, but sometimes with the other judokas as well.

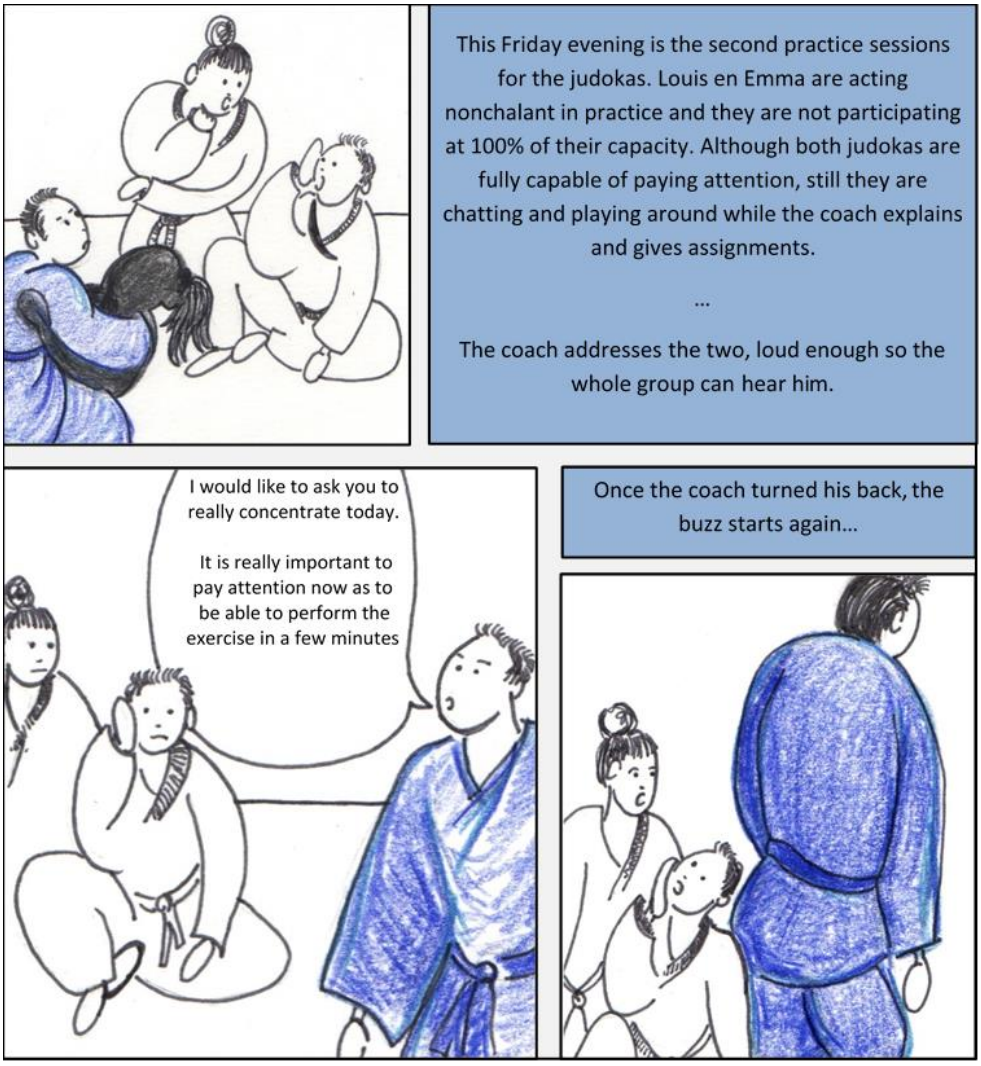
Emma practices judo since she was 7. She started because her older brother is a judoka as well. All her friends do dance class, but Emma would rather do Judo.

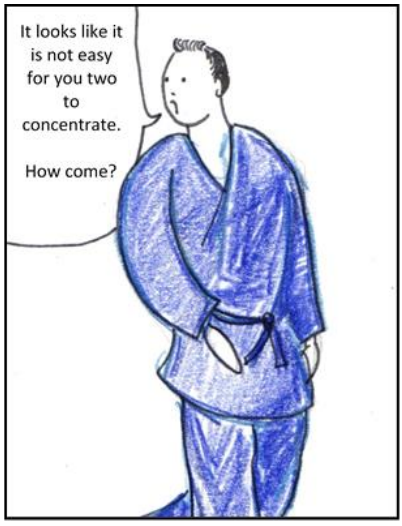
Louis practices judo since he was 8. He started after watching a judo tournament on television. He was very impressed and thought the judokas looked tough.

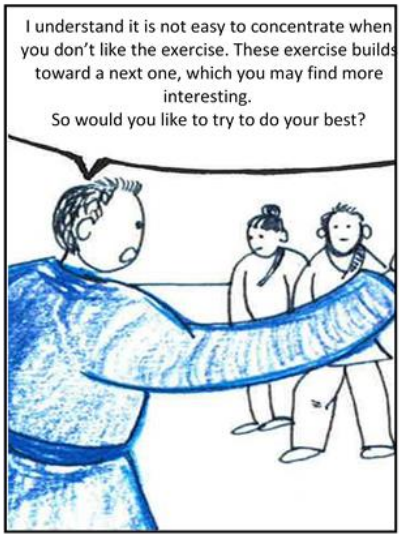
It is mid-February and the judo season is halfway for the judokas.



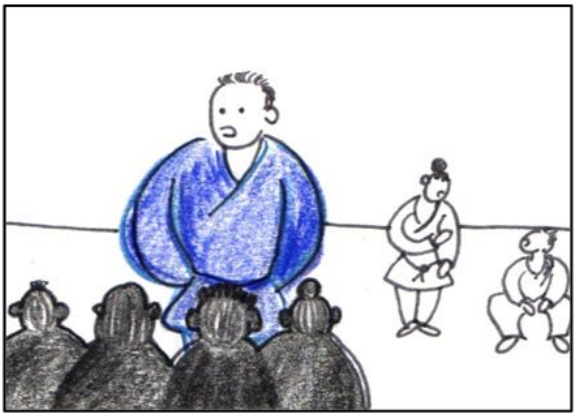



This Friday evening is the second practice sessions for the judokas. Louis en Emma are acting nonchalant in practice and they are not participating at 100% of their capacity. Although both judokas are fully capable of paying attention, still they are chatting and playing around while the coach explains and gives assignments.
...
The coach addresses the two, loud enough so the whole group can hear him.
I would like to ask you to really concentrate today.
It is really important to pay attention now as to be able to perform the exercise in a few minutes
Once the coach turned his back, the buzz starts again...

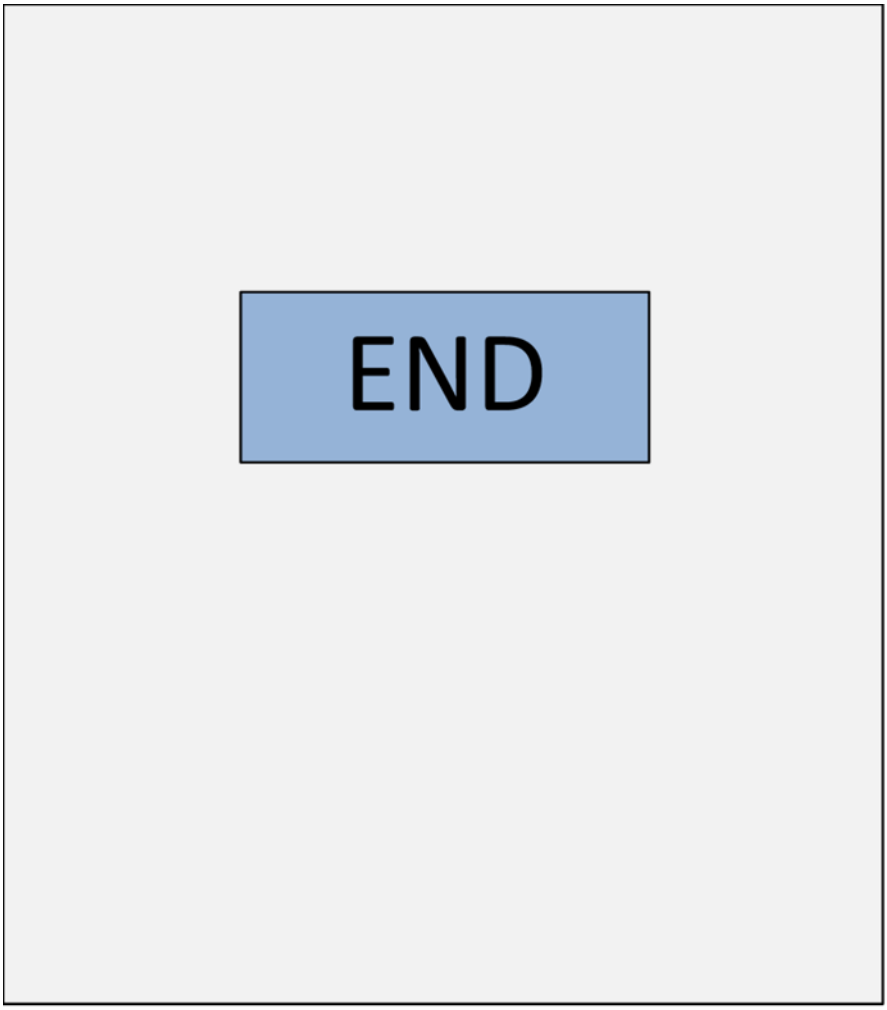




The coach wants to continue with the practice session. Meanwhile, the two judokas start blaming each other.




The coach turns to Emma and Louis and says loud enough so the whole group can hear him…
Ok, this cannot continue like this.
You can choose:
whether you try another partner,
or you continue together but in a serious fashion.
…and says loud enough so the whole group can hear him…
Meanwhile, the other judokas were finished with the exercise. The coach turns to Emma and Louis again…
Ok, lets continue now.
I ask you one last time to concentrate so the group is not interrupted anymore and we can continue with another exercise later on.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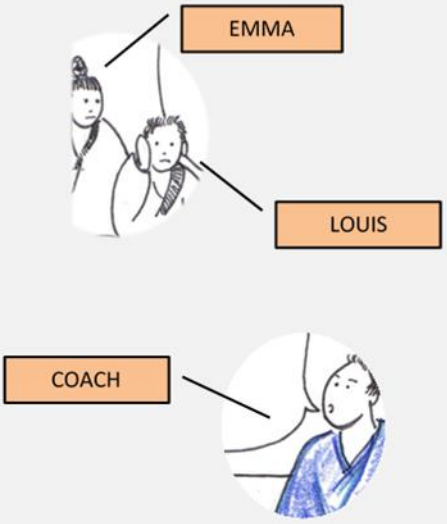
3.Controlling style – Struggling situation

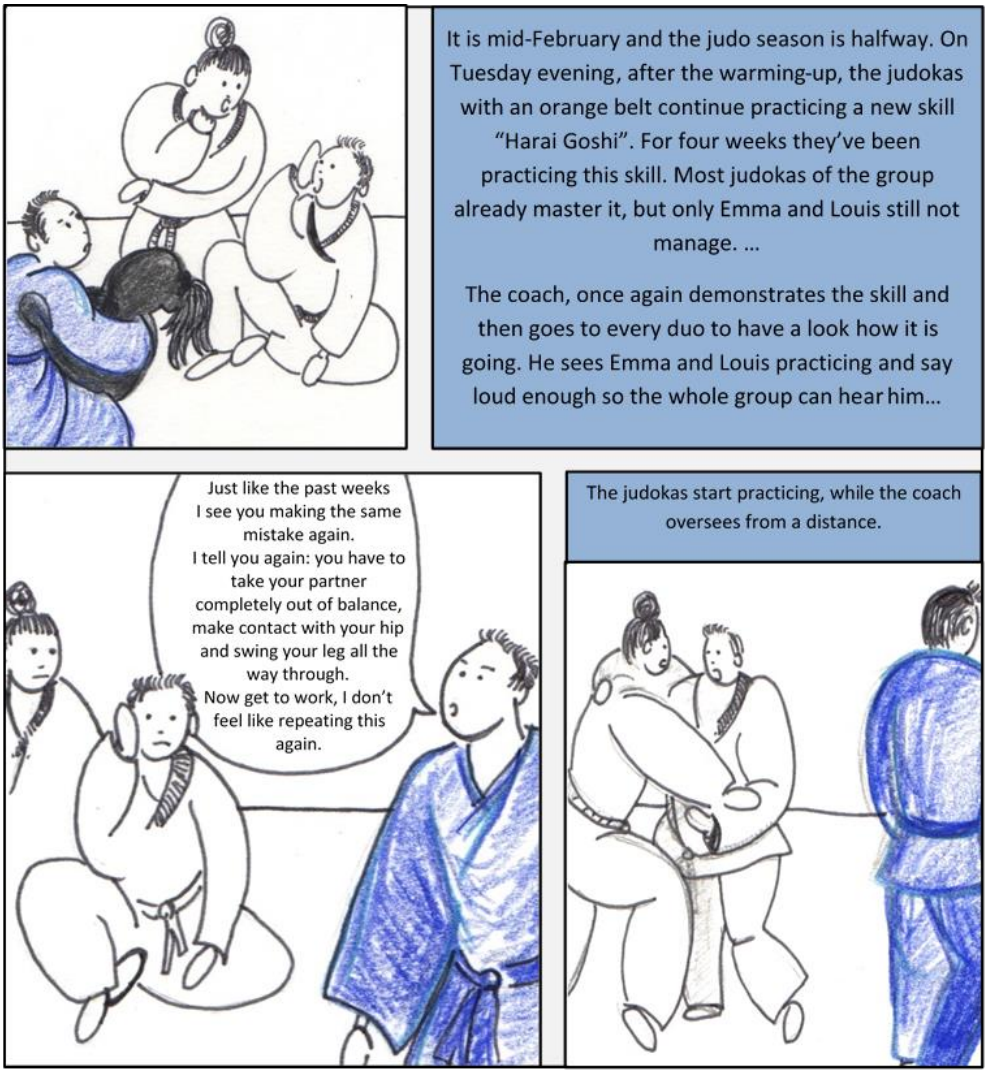
Emma and Louis are both members of judo club ***Wasa Hari.*** They both have an orange belt and are 12 years of age. From early on they have been coached by the coach. Practice is judo club *Wasa Hari* is on Tuesday and Friday evening. Emma and Louis are almost always present. Most of the times they practice on each other, but sometimes with the other judokas as well.

Emma practices judo since she was 7. She started because her older brother is a judoka as well. All her friends do dance class, but Emma would rather do Judo.

Louis practices judo since he was 8. He started after watching a judo tournament on television. He was very impressed and thought the judokas looked tough.

It is mid-February and the judo season is halfway for the judokas.




It is mid-February and the judo season is halfway. On Tuesday evening, after the warming-up, the judokas with an orange belt continue practicing a new skill "Harai Goshi". For four weeks they've been practicing this skill. Most judokas of the group already master it, but only Emma and Louis still not manage. …
The coach, once again demonstrates the skill and then goes to every duo to have a look how it is going. He sees Emma and Louis practicing and say loud enough so the whole group can hear him…
Just like the past weeks I see you making the same mistake again. I tell you again: you have to take your partner completely out of balance, make contact with your hip and swing your leg all the way through. Now get to work, I don't feel like repeating this again.
The judokas start practicing, while the coach oversees from a distance.

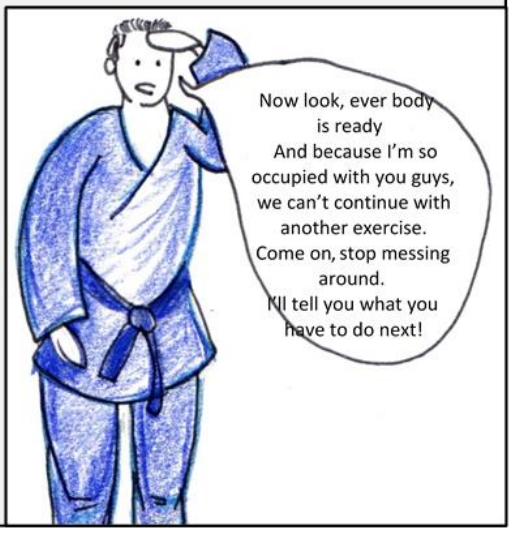

But just do it the way I told you to. What is so difficult about that?
But that is what I'm trying. I'm not able to take Louis out of balance. He already has his leg on the floor before I can throw him.
Pff. This is way too hard
Listen, if it works for the others, it should work for you too. You have to swing your leg higher. I'll catch up with you later. Make sure you master it by then.
After a few minutes of practice, the coach comes over to Emma and Louis but they still have the same problem…

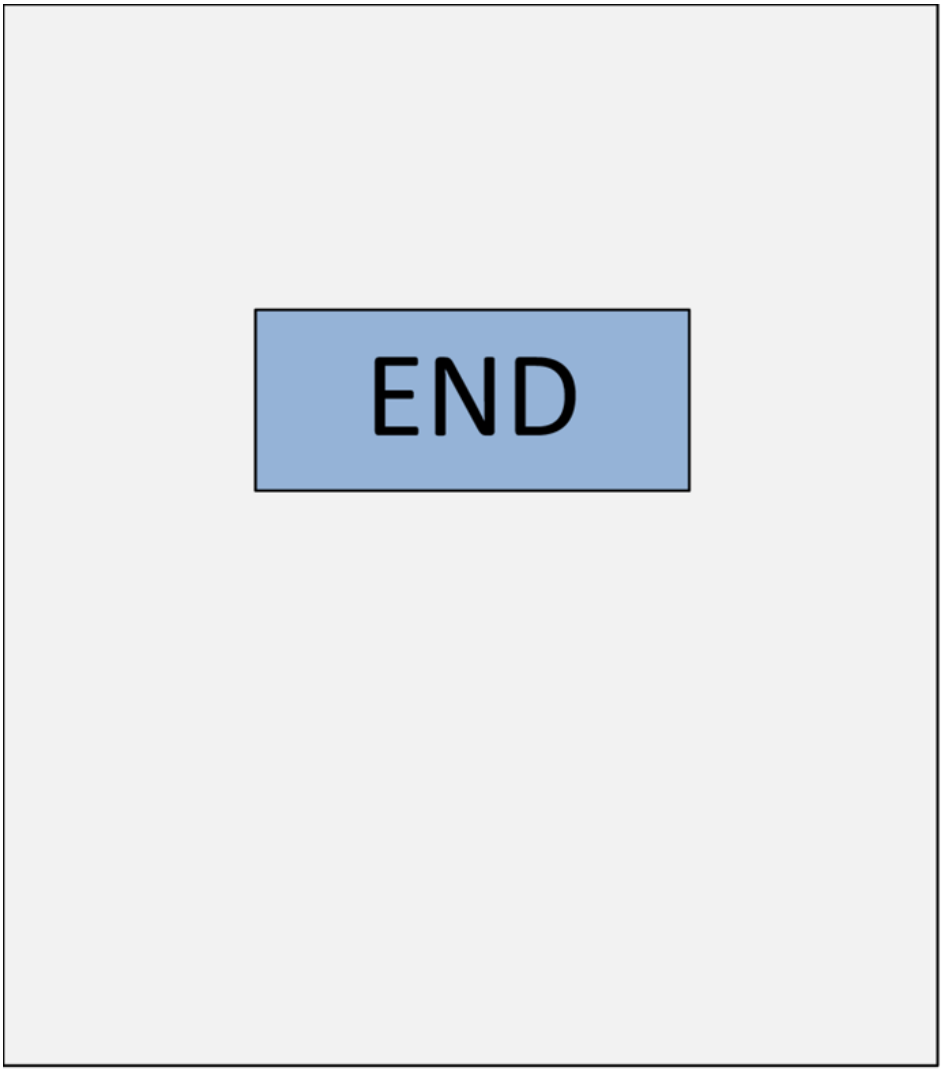
The coach turns to Emma and Louis and says loud enough so the whole group can hear him…

Now I am done. You are still not doing it right, although this is a basic exercise. You can stop now, there is no point in continuing. Just wait on the bench until we we start the next exercise.

…and says loud enough so the whole group can hear him…

Meanwhile the other judokas were finished with the exercise, standing around doing nothing. The coach again turns to Emma and Louis again…

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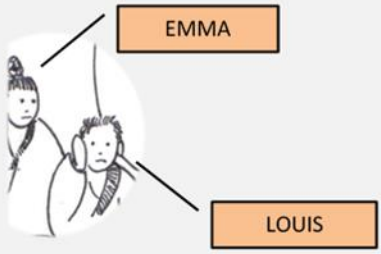
4.Controlling style – Disrupting situation

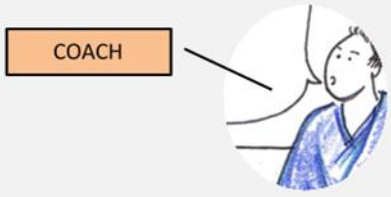
Emma and Louis are both members of judo club ***Wasa Hari.*** They both have an orange belt and are 12 years of age. From early on they have been coached by the coach. Practice is judo club *Wasa Hari* is on Tuesday and Friday evening. Emma and Louis are almost always present. Most of the times they practice on each other, but sometimes with the other judokas as well.

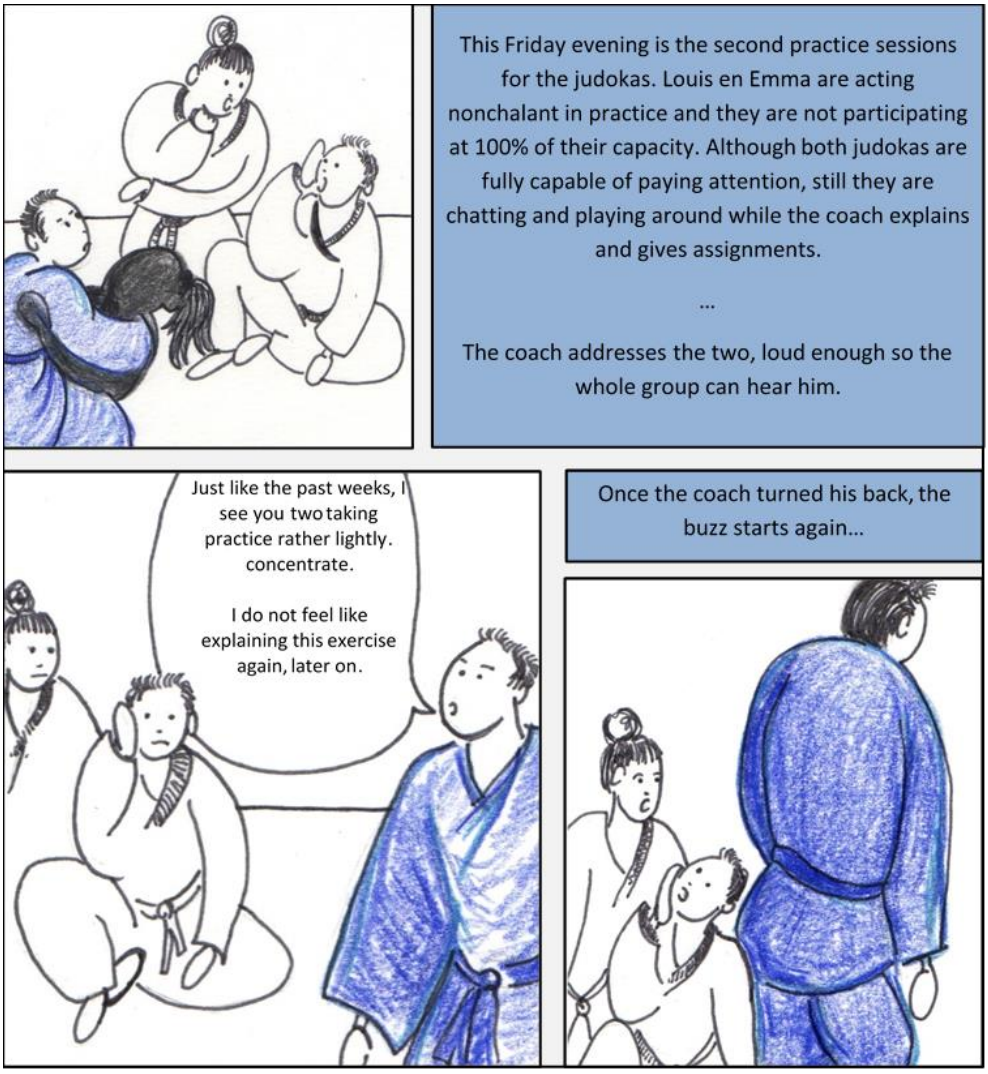
Emma practices judo since she was 7. She started because her older brother is a judoka as well. All her friends do dance class, but Emma would rather do Judo.

Louis practices judo since he was 8. He started after watching a judo tournament on television. He was very impressed and thought the judokas looked tough.

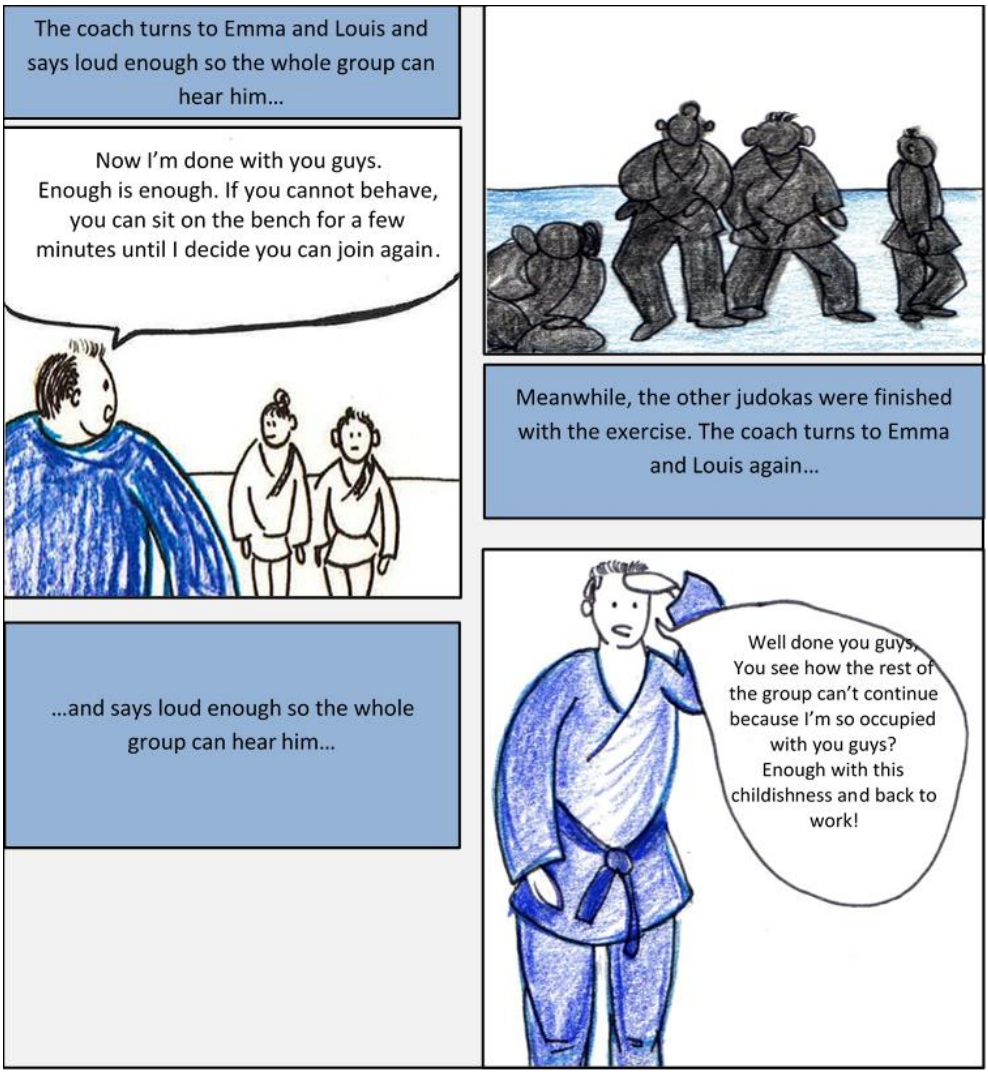
It is mid-February and the judo season is halfway for the judokas.

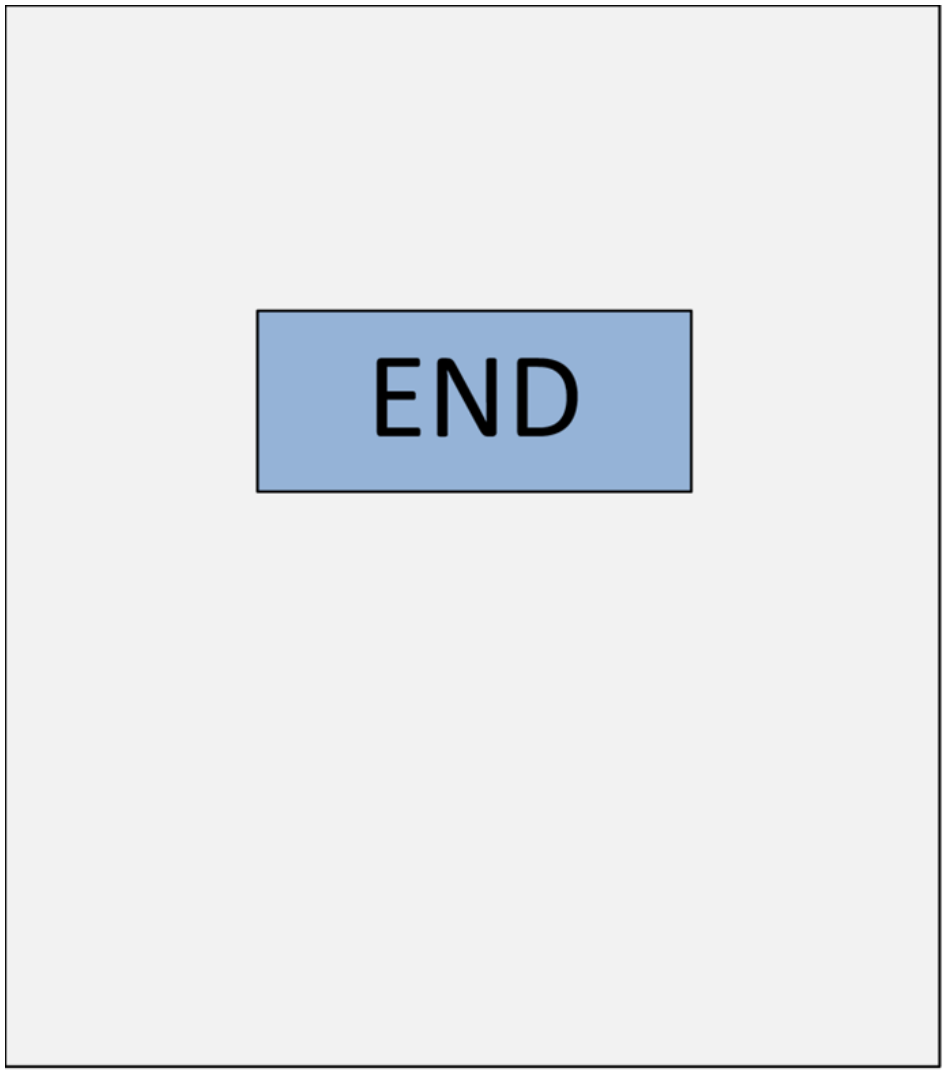





This Friday evening is the second practice sessions for the judokas. Louis en Emma are acting nonchalant in practice and they are not participating at 100% of their capacity. Although both judokas are fully capable of paying attention, still they are chatting and playing around while the coach explains and gives assignments.
...
The coach addresses the two, loud enough so the whole group can hear him.
Just like the past weeks, I see you two taking practice rather lightly. concentrate.
I do not feel like explaining this exercise again, later on.
Once the coach turned his back, the buzz starts again...


Hey Hey, enough now! What is the problem anyway?
Yes but, he's distracting me
Pff, I hate this exercise.
I don't want to know. You better make sure I do not have to intervene anymore. If not, you may expect a punishment.
The coach wants to continue with the practice session. Meanwhile, the two judokas start blaming each other.


The coach turns to Emma and Louis and says loud enough so the whole group can hear him…
Now I'm done with you guys. Enough is enough. If you cannot behave, you can sit on the bench for a few minutes until I decide you can join again.
…and says loud enough so the whole group can hear him…
Meanwhile, the other judokas were finished with the exercise. The coach turns to Emma and Louis again…
Well done you guys, You see how the rest of the group can't continue because I'm so occupied with you guys? Enough with this childishness and back to work!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Chapter 6

Adopting a Helicopter-perspective towards Motivating and Demotivating Coaching: A Circumplex Approach[1]

[1] Delrue, J.*, Reynders, B.*, Aelterman, N., De Backer, M., Decroos, S., De Muynck, G-J, Fontaine, J., Fransen, K., Haerens, L., van Puyenbroeck, S., Vande Broek, G., & Vansteenkiste, M. (2018). Adopting a Helicopter-perspective towards Motivating and Demotivating Coaching: A Circumplex Approach. *In revision*.

Based on Self-Determination Theory, the present study adopts a helicopter-perspective towards motivating (i.e., autonomy support, structure) and demotivating coaching (i.e., control, chaos). Among five independent samples, consisting of individual and team sport coaches (N = 893; Mage = 37.83 years) and athletes (*N* = 377; Mage = 17.46 years), Multidimensional Scaling (MDS) analyses were used to examine how a variety of coaching practices reflective of four different coaching styles (i.e., autonomy support, control, structure, and chaos), assessed with a new vignette-based instrument, related to one another. Findings revealed that the (de)motivating practices could be graphically presented within a two-dimensional circumplex, with the horizontal axis representing the level of need-supportive coaching behavior and the vertical axis representing the level of coach directiveness. Moreover, the four coaching styles could be segmented in eight more specific approaches (i.e. clarifying, guiding, attuning, participative, awaiting, abandoning, domineering, and demanding), which formed an ordered sinusoid pattern of correlations, both among each other and in relation to a variety of critical outcomes (e.g. coach need satisfaction, athletes' motivation). It is discussed how a circumplex approach produces both a more integrative and more fine-grained insight regarding (de)motivating coaching behaviour, with resulting implications for practice.

Introduction

Youth athletes' quality of sport motivation is essential for their enduring engagement, well-being, and performance (Gillet, Vallerand, Amoura, & Baldes, 2010; Podlog et al., 2015; Vallerand & Losier, 1999). A few dozen studies, grounded in Self-Determination Theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2017), a broad theory on human motivation and well-being, have shown that high quality motivation flourishes when coaches rely on an autonomy-supportive and structuring style, while the opposite is true if coaches hold a more chaotic or controlling style. Coaches who adopt an autonomy-supportive style try to maximize athletes' sense of volition and psychological freedom by adopting a curious and accepting attitude (Mageau & Vallerand, 2003). When relying on a structuring style coaches aim to foster athletes' sense of effectiveness and mastery by adopting a process-oriented attitude (Curran, Hill, & Niemiec, 2013; Soenens & Vansteenkiste, 2010). When coaches adopt a chaotic style, it remains confusing for athletes what they should do and how they can develop their skills (Mageau & Vallerand, 2003; Skinner, Johnson, & Snyder, 2005). In the case of coach control, coaches force athletes to think, feel, and behave in a prescribed way at the expense of athletes' sense of volition and psychological freedom (Bartholomew, Ntmoumanis, Thøgersen-Ntoumani, 2009; 2010).

Although research has begun to systematically study the interplay between these two motivating (i.e. autonomy support and structure) and two demotivating (i.e. control and chaos) coaching styles (e.g., Curran et al., 2013), what is lacking to date is a helicopter view that allows one to see how these styles relate to one another. Such a helicopter viewpoint may shed light on some of the pitfalls associated with the autonomy-supportive and structuring style, as echoed by coaches. Indeed, in spite of its well-documented benefits (Mageau & Vallerand, 2003), some sport coaches fear that a highly autonomy-supportive style will turn into a chaotic or laissez-fair style. Similarly, too much structure may also have its downside, if it turns into

rigid control and pressure. Recently, in the educational domain, Aelterman et al. (2018) provided such a helicopter-perspective as various motivating and demotivating teaching practices could be grouped into a circular structure consisting of four broader areas, representing the teaching styles of autonomy support, control, structure, and chaos. As can be noticed in Figure 1, each teaching style could be subdivided into two more specific subareas, reflecting a more specific approach.

The primary aim of the current study was to build on this promising body of work by examining whether motivating and demotivating coaching behaviors could equally be organized according to such a circumplex model. This was deemed important because a circumplex model allows both for greater integration, as multiple coaching styles are brought together in a broader picture, and for greater refinement, as broader styles get subdivided in different subareas, which are systematically related to a host of desirable (e.g., autonomous motivation, need satisfaction) and undesirable (e.g., controlled motivation and need frustration) outcomes among both athletes and coaches. Two secondary aims involved examining whether mean level differences between identified styles and subareas emerged as function of sport type and addressing coach-athlete convergence in the identified coaching styles and subareas.

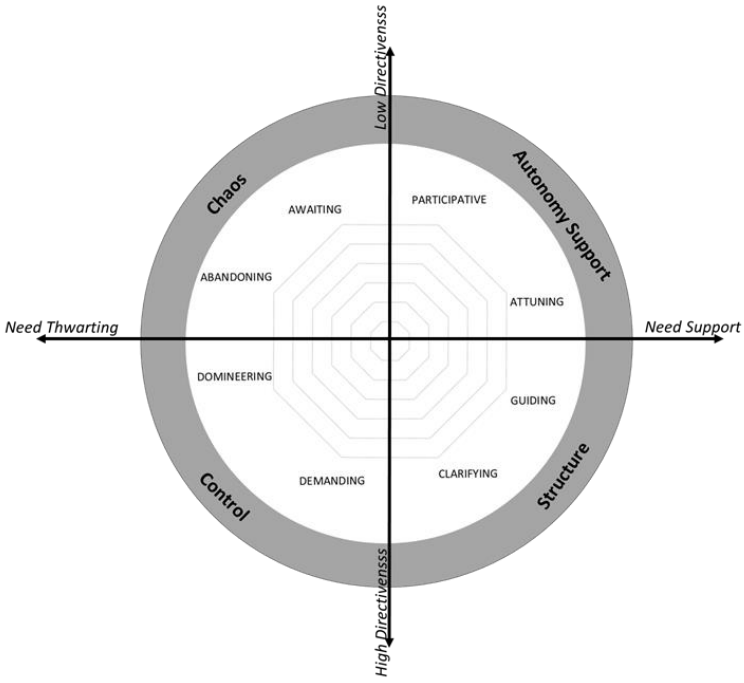

Figure 1: Theoretical Representation of the Gradual Approach to Coaching

Need-supportive and Need-thwarting Coaching

Within SDT, the psychological needs for autonomy, competence, and relatedness are considered essential nutriments for athletes' psychological growth, engagement, and well-being (Deci & Ryan, 2000). That is, whether athletes derive pleasure from their sport, persist, and excel or instead need to drag themselves to the sport club, and eventually drop-out depends on, respectively, the satisfaction and frustration of these basic psychological needs. Specifically, when satisfied, athletes experience a sense of psychological freedom and volition (i.e., autonomy), effectiveness (i.e., competence) and connection and warmth (i.e., relatedness) during their sport participation. When frustrated, however, athletes feel coerced and pressured (i.e., autonomy), ineffective and like a failure (i.e., competence), and isolated and excluded (i.e., relatedness). Importantly, need frustration does not denote

the mere absence or lack of need satisfaction as the psychological needs must be actively thwarted or undermined for need frustration to occur (Bartholomew et al., 2011; Haerens, Aelterman, Vansteenkiste, Soenens & Van Petegem, 2015; Vansteenkiste & Ryan, 2013).

Athletes' need satisfaction is fostered when coaches adopt an autonomy-supportive style (Adie, Duda, & Ntoumanis, 2012; Conroy & Coatsworth, 2007; Rocchi, Pelletier, & Couture, 2013). Autonomy support involves a variety of practices, which in the circumplex identified by Aelterman et al. (2018), were found to fall apart into a participative and attuning subarea. Specifically, practices such as offering choice, asking for athletes' input and welcoming their suggestions fell in a *participative* subarea, as these practices allow for individuals to have a say and to participate in a joint decision process. Autonomy-supportive practices such as nurturing athletes' personal interests, acknowledging their negative affect and resistance, and offering a meaningful rationale (Mageau & Vallerand, 2003) fell in an *attuning* subarea because when relying on these practices, coaches are trying to attune to the athletes' perspective in these instances.

While the benefits of coach autonomy support for athletes' motivation (e.g., Amorose & Anderson-Butcher, 2007; Reynolds and McDonough, 2015), enjoyment (e.g., Quested, 2013), perseverance (e.g., De Muynck et al., 2017; Pelletier, Fortier, Vallerand, & Brière., 2001), and well-being (e.g., Adie et al., 2012; Gagné, Ryan, & Bargmann, 2003), have been well-documented, the independent role of coach control has long been dealt with indirectly, that is, it was treated as the need-thwarting counterpart of autonomy support (e.g., Reinboth, Duda & Ntoumanis, 2004). Parallel to the distinction between need satisfaction and need frustration, it has been increasingly recognized that controlling coaching involves more than the absence of autonomy support.

In the case of coach control, coaches actively interfere with athletes' volitional functioning through the use of a multitude of strategies that fell either in the demanding or domineering subarea in the circumplex (Aelterman

et al., 2018). When *demanding*, coaches point to athletes' duties and responsibilities, thereby using forceful language, threats of sanctions, or the contingent use of rewards (Bartholomew et al., 2011). When *domineering*, coaches are experienced as highly intrusive and manipulative as the target involves the athlete as a person instead of the athlete's behavior. Domineering coaching involves the use of power-assertive practices such as excessive personal control, intimidation, guilt-induction and shaming (Bartholomew et al., 2010). Controlling coaching has been found to be uniquely predictive of low quality motivation (i.e. controlled motivation), and even a lack of motivation (i.e. amotivation) (Pelletier et al., 2001), burn-out among young adolescent soccer players (Balaguer et al., 2012), and moral disengagement and antisocial behavior (Delrue, et al., 2017; Hodge & Lonsdale, 2011).

Much like coach autonomy support and control, the provision of structure also involves a number of key practices which were found to fall apart into two subareas in the circumplex, that is, a guiding and clarifying approach (Aelterman et al., 2018). When *clarifying*, coaches set clear expectations and goals and follow-up on them in a consistent way, thereby monitoring athletes' progress (Curran et al., 2013). When *guiding*, coaches express confidence in the athletes' capacity, they encourage their athletes in a constructive way and they offer adjusted and helpful information and suggestions (e.g., feedback) as to support athletes' progress (Curran, 2013; Fransen, Boen, Vansteenkiste, Mertens, & Vande Broek, 2018). When coaches are highly structured, athletes perceive the environment to be predictable, safe, and focused on their progress such they benefit in terms of competence, behavioral engagement, and well-being (Black & Weiss, 1992; Carpentier & Mageau, 2013, Curran et al., 2013).

Much like control deserves being studied separately from autonomy support, also chaos needs being examined in its own right as it denotes more than the absence of structure (Skinner et al., 2005; Vansteenkiste & Ryan, 2013). That is, when coaches are chaotic, they act in an inconsistent and unpredictable way, which creates confusion and may interfere with athletes'

skill-development and their achievement of desired outcomes. The question that coach chaos represents a separate style that comes with a cost has largely been neglected in the SDT-literature. In their circumplex model, Aelterman et al. (2018) found teacher chaos to be subdivided into an abandoning and awaiting subarea. Extrapolating from this work, in the case of an *abandoning* approach, athletes have the experience to be left to their own devices as, after repeatedly intervening, their coach has given up. In the case of an *awaiting* approach, the coach does not plan too much instead awaits how things unfold and whether athletes will take initiative themselves.

A Helicopter-perspective: The Circumplex Model

To obtain a helicopter-perspective on how different motivating (i.e., autonomy support, structure) and demotivating (i.e., control, chaos) teaching styles relate to each other, Aelterman et al. (2018) made use of Multidimensional scaling (MDS; Borg, Groenen, & Mair, 2013). This explorative statistical technique graphically visualizes the relation between different (de)motivating practices by plotting inter-item distances in a geometrical space. Three key findings emerged from their analyses, involving two large samples of secondary school teachers and students.

First, as can be noticed in Figure 1, a two-dimensional circumplex structure was identified, which allowed for a more integrative insight into the variety of teaching practices. Specifically, the horizontal dimension (i.e., x-axis) reflects the degree to which the teacher supports, relative to thwarts, students' psychological needs, with autonomy support and structure yielding positive coordinates, and control and chaos yielding negative coordinates. The vertical dimension (i.e., y-axis) concerned the extent to which the teacher is directive and taking the lead in the interaction, with structure and control yielding positive coordinates and chaos and autonomy support yielding negative coordinates. Second, the circumplex produced more refined insight as eight specific subareas (i.e., clarifying, guiding, attuning, participative,

awaiting, abandoning, domineering, and demanding) were identified, which could be characterized according to the constituting dimensions of need support and directiveness (Appendix 2). These eight subareas were not a priori imposed, but naturally emerged from the data, with teaching practices within a given subarea forming a coherent cluster (i.e., an approach). Third, consistent with the assumptions of a circumplex, these identified subareas correlated in an ordered way with adjacent subareas being positively correlated (being indicative of their compatible nature), and correlations weakening and even becoming negative (being indicative of their more conflictual nature) when moving along the circular structure. To illustrate, whereas the guiding approach correlated positively with the adjacent attuning and clarifying approach, it yielded a negative correlation with the abandoning approach. Importantly, this ordered pattern of correlates, representing a sinusoid structure, was also found in relation to external outcomes. To illustrate, students' ratings of teacher's quality systematically correlated with the distinguished subareas (Aelterman et al., 2018), with the correlations peaking and being strongly positive for the guiding and attuning subarea, while being strongly negative for the domineering and abandoning subarea.

In light of these findings, it appears both illuminating and more fruitful to distinguish subareas within each of the coaching styles that can get organized in a more holistic and meaningful way via a circumplex structure. That is, instead of treating autonomy support, control, structure, and chaos as distinct categories that should yield unique correlates, Aelterman et al. (2018) argued that the ordered pattern of correlates warrants a gradual instead of a categorical perspective towards (de)motivating teaching. That is, motivating and demotivating approaches do not differ from each other in a black-white fashion. Instead, the differences are more gradual and these differences get reflected by the degree to which each identified subarea in the circumplex is need-supportive relative to need-thwarting and high relative to low in directiveness.

Such a gradual perspective could make a meaningful contribution to the existing coaching literature and practice. That is, some coaches may be concerned that the use of autonomy support may result in chaos. Such concerns are legitimate and a gradual perspective may indicate which autonomy-supportive strategies exactly (e.g., asking input from athletes) may lean closer to an awaiting approach. Furthermore, by examining coaching from a gradual instead of a categorical perspective, the ordered pattern provides a first indication of how coaches may shift from one approach to another along the circumplex as a function of encountered obstacles or facilitating factors. Finally, the more differentiated assessment of motivating approaches will allow for a more detailed examination of mean level differences between individual and team sports. Past research indicated that athletes in team, relative to individual sports perceive their coach to display more autocratic and less democratic behavior (Hollembeak & Amorose, 2005; Terry, 1984). Whereas coaches of team sports may act in a more controlling way to maintain discipline, the one-on-one relationship characteristic of individual sports may allow for a more autonomy-supportive style in general and a more athlete-attuned and participative approach in particular (van de Pol, Kavussanu, & Kompier, 2015).

Present Study

Although past research has focused on the role of coach autonomy support in combination with either coach control (e.g., Amorose & Anderson-Butcher, 2015; Bartholomew et al., 2011; Haerens et al., 2017) or coach structure (Curran et al., 2013), to the best of our knowledge, no single study within the SDT literature on sport coaching has conducted an in-depth investigation of how autonomy-supportive, controlling, structuring, and chaotic coaching styles, when considered simultaneously, relate to each other. Therefore, following Aelterman et al. (2018), the primary objective of the present study was to adopt a helicopter-perspective to gain both a more

integrative and fine-grained insight in how a broad variety of need-supportive (i.e., autonomy support, structure) and need-thwarting (i.e., control, chaos) coaching practices relate to each other as well as to external outcomes.

To achieve this goal, a new vignette-based instrument was developed, which contained specific situations that depict the way how sport coaches act during training, during competitive games as well as when they take up a pedagogical role, thereby introducing and monitoring guidelines for desirable behavior. Although there exist several validated coaching style instruments (e.g., Bartholomew et al., 2011), the items used are rather generic in nature as they are not tied to a concrete situation and they are often incomplete because the chaotic coaching style is not assessed. To overcome these two shortcomings and to obtain a more encompassing instrument involving a variety of coaching styles and constituting approaches, a new vignette-based instrument was developed. The developed vignettes were highly ecologically valid as they represent frequently occurring and specifically described coach-athlete interactions. In response to each of these vignettes, four different reactions were formulated corresponding to the theoretical dimensions of coach autonomy support, control, structure and chaos.

Consistent with the work in the educational domain (Aelterman et al., 2018), we expected that the variety of assessed (de)motivating coaching practices could be organized along a clearly interpretable two-dimensional circumplex (see Figure 1). That is, four broader areas, reflecting each of the four assessed coaching styles (i.e., autonomy support, control, structure, and chaos), would be retained, which would be represented by a dimension denoting the degree of need-supportive, relative to need-thwarting coaching and a dimension denoting the level of coach directiveness (Hypothesis 1a). To gain confidence in the stability of this two-dimensional circumplex, we examined whether a similar structure would emerge in both coaches and athletes (Hypothesis 1b).

Further, given the assessment of a broad variety of practices, we expected that, congruent with model obtained in the educational domain

(Aelterman et al., 2018), each of the four broader styles (i.e., autonomy support, structure, control, chaos) would get segmented into two subareas, each reflecting a more circumscribed cluster of practices (see Figure 1; Hypothesis 2a). Further, in line with the assumptions underlying a circumplex model, testifying to the internal validity of the model, we expected the correlations between two adjacent subareas to be positive, while the correlations would become increasingly less positive and even negative as one moves along the circle away from a specific subarea, being reflective of a sinusoid pattern (Hypothesis 2b).

A similar ordered pattern of correlates was hypothesized between the identified subareas and commonly used coaching measures in the literature (CCBS, Bartholomew et al., 2010; TASCQ, Belmont, Skinner, Wellborn, & Connell, 1988; SCQ, Williams, Grow, Freedman, Ryan, & Deci, 1996). Congruent with the assumptions underlying the hypothesized circumplex model, we expected the correlation between a specific subarea (e.g., attuning) and a corresponding coaching style measure in the literature (e.g., coach autonomy support) be most pronounced, with these correlations becoming decreasingly positive and even negative as one gradually moves from one subarea to another along the circumplex (Hypothesis 3).

To further examine the external validity of the proposed circumplex, we examined the pattern of correlates between the identified overarching styles and subareas and a variety of external outcomes, as assessed among both coaches (i.e. need-based experiences) and athletes (i.e., need-based experiences, motivation, rated coach evaluation). Given that past work found coach need satisfaction to enable coaches to adopt a more autonomy-supportive stance towards their athletes (Stebbings, Tayler, Spray, & Ntoumanis, 2012), we expected the correlates between coach need satisfaction and the need-supportive coaching subareas (i.e., attuning, guiding) to be most pronounced positive, while experiences of need frustration would relate to the more need-thwarting subareas (i.e., abandoning, domineering). Along similar lines, the most need-supportive subareas were hypothesized to yield the

strongest positive correlates with athletes' experienced need satisfaction, autonomous sport motivation, and the rated quality of the coach, while the most need-thwarting subareas would yield the strongest positive correlates with athlete need-frustration, controlled motivation, and amotivation (Hypothesis 4) (Aelterman et al., 2018; Amorose & Anderson-Butcher, 2007).

Supplementary to our main objective to adopt a helicopter-perspective towards (de)motivating coaching, we had two ancillary aims. First, given the paucity of past studies that focused on coaches and athletes simultaneously, we sought to directly compare the responses of coaches and athletes by examining their correspondence (i.e., to what extent do coach and athlete responses relate to each other?) and their discrepancy (i.e., to what extent are there mean-level differences between coaches and athletes? (Korelitz & Garber, 2016). Past research has shown that such correspondence is rather modest (Smith, et al., 2016), possibly because athletes form their own idiosyncratic viewpoints of their coach (Macquet & Stanton, 2014) or because coaches have an overly positive view of their own coaching behavior due to biased interpretations or social desirable answering. If the latter tendencies are operative, mean level discrepancies may be found such that coaches score themselves relative higher on need-supportive and lower on need-thwarting subareas compared to athletes (Hypothesis 5). A second ancillary objective involved the examination of the role of sport type (i.e., team vs. individual sport). As previous research (e.g., Hollembeak & Amorose, 2005; Terry, 1984; van de Pol et al., 2015) found coaches in team sports to display different behavior compared to coaches in individual sports types, we explored whether any mean-level differences in the overarching styles and subareas would be found as a function of sport type.

Table 1: Overview of the assessed variables across the five samples

Sample	1	2	3	4	5	
	Coach	Coach	Coach	Coach	Coach	Athlete
N	*406*	*157*	*183*	*106*	*41*	*377*
Coaching style						
SIS Questionnaire	X	X	X	X	X	X
Autonomy support (SCQ)	X		X		X	X
Structure (TASCQ)	X		X		X	X
Control (CCBS)	X		X		X	X
Involvement (TASCQ)	X	X		X		
External outcomes						
Motivation (BRSQ)						X
Psychological Needs (BPNSNF)	X	X			X	X
Coach Evaluation						X

Note. SIS = Situation in Sport Questionnaire: SCQ = Sport Climate Questionnaire; TASCQ = Teacher as Social Context Questionnaire; CCBS = Controlling Coach Behaviors Scale; BRSQ = Behavioral Regulations in Sports Questionnaire: BPNSNF = Basic Psychological Need Satisfaction and Need Frustration scale

Method

Participants and Procedure

For the present study, data were collected among four independent coach samples, and a mixed sample of coaches and athletes. As can be noticed in Table 1, different aims were addressed in different samples, depending on the type of measures being included. Table 2 describes the basic socio-demographic characteristics for each sample. Across all samples, a total of 893 coaches and 377 athletes participated. Both male (72.3%) and female coaches (27.7%) from a variety of individual (41.4%) and team sports (58.6%) participated. Coaches were on average 37.83 (*SD* = 12.73) years old and had 10.40 (*SD* = 9.32) years of experience in coaching. Athletes (43.5% female) were on average 17.46 (*SD* = 2.77) years old, and most of them came from team sports (68.2%). Sample 1 and 2 were collected in the context of a series of workshops for youth coaches on how to adopt motivating coach behaviors. Online questionnaires were completed as part of a baseline assessment before youth coaches began the training. Undergraduate psychology students of Ghent University collected samples 3 and 4 of coaches in return for course credits. By ways of an information session about the recruitment procedure, it was assured that participants would be recruited in a standardized way. Finally, sample 5 involved a mixed sample of 41 coaches and their 377 athletes, who were invited via e-mail to complete an online version of the questionnaires. In each sample, an active informed consent form explaining the purposes of the study preceded the survey, and was signed by athletes who were sixteen years or older. When athletes were under the age of sixteen, parents signed the informed consent. Participation in the study was voluntary and confidential and participants could drop out at any time for any reason. The study was conducted in line with the ethical guidelines of the first authors' Universities. Specifically, ethical approval was granted for the collection of data in underaged athletes.

Table 2: Demographic characteristics of participants of five samples.

Sample		1	2	3	4	5	
Target group		Coach	Coach	Coach	Coach	Coach	Athlete
N		*406*	*157*	*183*	*106*	*41*	*377*
Sex	Male	71.2%	71.9%	70.5%	81.1%	70.7%	55.8%
	Female	28.8%	28.1%	29.5%	18.9%	29.3%	44.2%
Type of sport	Individual	45.6	51.6%	39.3%	42%	41.5%	30.6%
	Team	54.4	48.4%	60.7%	58%	58.5%	69.4%
Age	Range	16 – 73	17 – 78	17 - 65	17 – 67	20 – 66	12 – 24
	Mean	38.96	38.89	34.36	36.85	40.61	17.46
	SD	12.59	12.34	12.36	12.85	14.25	2.77
Coach experience	Range	0 – 57	0 – 42	1 – 40	1 – 40	1 – 40	-
	Mean	10.07	10.61	9.66	11.14	14.23	-
	SD	9.82	9.64	7.98	8.21	10.55	-
Level	Low level	67.0%	65.6%	54.1%	26.4%	32.5%	34.2%
	High level	33.0%	34.4%	45.9%	73.6%	67.5%	65.8%
Age	Under 12	45.3%	51.6%	45.9%	-	-	-
	12-18	43.1%	38.9%	33.3%	-	80.5%	67.9%
	Over 18	11.6%	9.6%	20.8%	-	19.5%	31.0%

Measures

To obtain scores for each of the measured constructs, an aggregated score was calculated by averaging the items of the construct at hand.

Common coach and athlete reports.

Coaching style. As noted, a new vignette-based instrument was developed for the present study. To generate vignettes, the validated Situation-in-School questionnaire (Aelterman et al., 2018) served a source of inspiration. Further, specific to the contexts of sports, three categories of vignettes were created, referring to the training context, the competition context, and the pedagogical role of coaches. As for the response items, different sources of information were relied upon. First, items were generated based on conceptual grounds, thereby ensuring that as many practices, being part of classic definitions of autonomy support, control, structure, and chaos, would be covered in the items (Reeve, 2009; Ryan & Deci, 2017; Soenens & Vansteenkiste, 2010). Specifically, for each dimension (e.g., autonomy support), the items covered practices belonging to one of both approaches (e.g., participative and attuning) identified by Aelterman et al. (2018). To assure that generated vignettes and its responses had high ecological and face validity (e.g., that they would occur in reality, be easily recognizable and be perceived as believable), sport psychologists and coaches of youth athletes were consulted. Prior to collecting the five samples reported in this contribution, two large pilot samples of youth coaches (N = 599) and athletes (N = 334) were collected, which helped to adjust and optimize the instrument[2].

The newly developed Situations-in-Sport Questionnaire presents 5 vignettes per role (i.e., during training, during competition and in a pedagogical role), resulting in a total of 15 situational vignettes (see Appendix 3). The presented vignettes either concern a problem situation, which requires

[2] See *Appendix 1, Note 1*

an intervention and remedial action from the coach (e.g., “An athlete displays anxiety before the game. You…”), or a non-problematic situation in which the coach takes a more proactive role (e.g., “You give a hard and difficult exercise, which asks for an extra effort from your athletes. You…”). For each of the 15 vignettes coaches were provided with four different behavioral responses corresponding to the overarching autonomy-supportive, controlling, structuring, and chaotic styles. Coaches were asked to rate on a 7-point Likert scale from 1 (*does not describe me at all*) to 7 (*describes me extremely well*) to which degree each of the four reactions described themselves. For example: ‘You notice that an athlete is not satisfied with the fact that he is not selected for the team for the upcoming competitive event. How do you respond?’: (a) 'You do not give any explanation and leave it like that' (i.e., chaos), (b) ‘You have a conversation with him/her and acknowledge his/her frustration, and give a meaningful explanation for the non-selection’ (i.e., autonomy support), (c) 'You say: "You need to learn to accept this. It is my decision after all".’ (i.e., control), and (d) 'You indicate the steps the athlete needs to take to get selected in the future' (i.e., structure).

Athletes answered the same 15 vignettes, although the vignettes and responses were slightly adapted to represent the athlete rather than the coach perspective. Where necessary, the language of the vignettes and responses was simplified, as to make sure athletes aged 14 and older would be able to understand and complete the questionnaire. Athletes were asked to rate on a 7-point Likert scale from 1 (*does not describe my coach at all*) to 7 (*describes my coach extremely well*) the extent to which the items correspond to their coach’s behavior.

Construct validation measures. Coaches completed adapted versions of the Sport Climate Questionnaire (SCQ; SDT website: http://www.psych.rochester.edu/ SDT/), the Teacher as Social Context Questionnaire – Teacher version (TASCQ; Belmont et al., 1988) and the Controlling Coaching Behavior Scale (CCBS; Bartholomew et al., 2010). Adaptations primarily concerned changes in the perspective of the items, as

all original scales assessed the athlete perspective on coaching behaviors, or changes in the domain specificity of the scale in case of the TASCQ, which was originally developed to assess the motivating styles of teachers. The SCQ provided six items for autonomy support (e.g., "I try to understand how my athletes see things before suggesting a new way to do things, $\alpha = .85$). The TASCQ provided eight items for structure (e.g., "I talk with my athletes about my expectations for them", $\alpha = .81$) and 11 for involvement (e.g., "I spend time with all athletes in my group"; $\alpha = .76$). Further, the CCBS provided 15 items for controlling coaching (e.g., "I try to motivate my athletes by promising a reward when they do well", $\alpha = .83$).

In a similar way, athletes answered to the translated original items of the SCQ, TASCQ and CCBS to measure athlete's perceptions of autonomy-supportive, structuring and controlling coaching behavior. Cronbach's alpha reliabilities were satisfactory and ranged from .71 to .86. Both coaches and athletes answered on a 7-point Likert scale ranging from 1 (*I completely disagree*) to 7 (*I completely agree*).

Need-based experiences. Coaches' and athletes' need satisfaction and frustration were measured with an adapted version of the Basic Psychological Need Satisfaction Need Frustration Scale (BPNSNF; Chen et al., 2015). The items were adapted by making them amendable for the sport context and the scale was shortened to 12 items, which has proven valid in previous studies (e.g., Mabbe, Soenens, Vansteenkiste, Van der Kaap-Deeder, & Mouratidis, in press). An explorative factor analysis on the coach and athlete data indicated that two factors could be retained, explaining 44% and 49% of the variance in total, with the need satisfaction and need frustration items loading on different factors. Internal consistencies were acceptable for both need satisfaction (six items, e.g., "During coaching, I feel a strong connection with people who are important to me"; $\alpha_{coach} = .71$; $\alpha_{athlete} = .79$) and need frustration (six items, e.g., "I feel I have no other choice but to coach athletes"; $\alpha_{coach} = .74$; $\alpha_{athlete} = .78$). Items were rated on a 7-point Likert scale ranging between 1 (*completely disagree*) and 7 (*completely agree*).

Unique coach reports.

Social desirability. Across samples 1 and 2, a total of 547 coaches completed a 10-item social desirability scale derived from Crowne & Marlowe (1960). This scale assessed the extent to which coaches tend to answer in a social desirable way (e.g., "I have never said something to someone to deliberately hurt his/her feelings"; α = .58). Items were dichotomously answered with "true" or "false".

Unique athlete reports.

Motivation. To assess athletes' motivation, we made used of the Behavioral Regulation in Sport Questionnaire (BRSQ: Lonsdale, Hodge, & Rose, 2008), which has been adapted by Assor, Vansteenkiste, and Kaplan (2009). Specifically, of the original 36 items of the BRSQ, only the items tapping into intrinsic motivation (n = 4) at a more general level were included, while items tapping into specific facets of intrinsic motivation (i.e., motivation to know, motivation to accomplish and motivation to experience stimulation) were left out. In line with Assor et al. (2009), we added four new introjection-approach motivation items (e. g., "I participate in my sport because I feel proud of myself if I persist") because the original BRSQ only includes 3 introjection-avoidance items and 1 rather general introjection motivation item. In a similar way, four newly created external-approach items were added (e. g., "I participate in my sport because I would be appreciated by others") in the present study. As can be noticed in Assor et al. (2009; Study 3), strong evidence for an ordered pattern of correlates between the different subtypes along the self-determination continuum was obtained. As a result, 32 items measuring three subtypes of autonomous motivation (i.e., intrinsic motivation, integrated regulation, and identified regulation; α = .85) and four subtypes of controlled motivation (i.e., introjection-approach regulation, introjection-avoidance regulation, external- approach regulation, and external-avoidance regulation α = .90) as well as amotivation (α = .88) were used.

Coach evaluation. To tap into coach evaluation, an 8-item scale used in prior work in the educational domain (Aelterman et al., 2018) was slightly adjusted to the coaching context. Athletes rated the quality of their coach by indicating whether they (a) wanted to be coached another season by this coach (e.g., "Next seasons, I would like to have the same coach"; 3 items), (b) found their coach's training clear and easy to execute (e.g., "The training of my coach was easy to execute"; 2 items), (c) would recommend their coach to other athletes (e.g., "I would recommend this coach to other athletes"; 2 items) and (d) would evaluate their coach as an excellent coach ("My coach is an excellent coach"; 1 item). All items were answered on a 7-point Likert scale ranging from 1 (*I completely disagree*) to 7 (*I completely agree*). To justify the inclusion of all 8 items, an exploratory factor analysis was performed, thereby retaining one single factor explaining 56% of the variance. After removing one item with a low loading, the remaining seven items, which all yielded a minimal loading of .50, were averaged to create a composite score ($\alpha = .90$).

Plan of Analysis

To address the aims of this study we always used the maximum amount of data available. As different measures were collected across samples (see Table 1), the number of included participants somewhat varied across the examined aims and hypotheses. To address our primary aim, that is, obtaining a helicopter perspective towards (de)motivating coaching, we conducted a multidimensional scaling analysis (MDS; Borg et al., 2013) on the 60 items (4 responses by 15 vignettes) to examine the dimensional structure of the SISQ-sport items. Specifically, MDS provides a graphical representation of (dis)similarities between items as distances between points in a geometrical space, with high and low correlations between items being, respectively,

represented by small and large distances[3] between points in the geometrical space. That is, practices tapping into the same coaching approach are clustering together within a given subarea in the geometrical representation[4]. Depending on their location in the circumplex, adjacent subareas should correlate positively, suggesting that both approaches are compatible, while subareas in direction opposition to one another should correlate negatively, suggesting that both approaches are more conflictual in nature. We used the PROXSCAL MDS procedure of SPSS to compute the configuration with non-metrical MDS. We performed this procedure once with all the coach data (Samples 1-5) combined in one larger sample (N = 893) to obtain a coach configuration and a second time to obtain an athlete configuration (Sample 5, N = 377). To test the stability of the dimensional structure across coaches and athletes, we subjected the obtained coach and athlete configurations to Generalized Procrustes Analysis (GPA; Borg et al., 2013; Borg & Groenen; 1997; Commandeur, 1991). GPA calculates the coach and athlete configurations in such a way that they correspond as closely as possible, without affecting the relative distances between items within each configuration. Based on this consensus configuration, we identified critical areas and subareas representing a specific coaching approach.

In a next step, to provide formal evidence for the differentiation between identified subareas, a series of confirmatory factor analyses were conducted. Specifically, for each pair of adjacent subareas, a differentiated two-factor solution was compared against a non-differentiated single-factor solution, through the calculation of a chi² change statistic. Then, mean scores were calculated for each identified (sub)areas by averaging the respective items belonging to an identified (sub)area, before calculating the Pearson zero order correlations between the identified (sub)areas.

With respect to the assessed external outcomes, Pearson zero order correlations were run to investigate whether the identified (sub)areas in the

[3] See *Appendix 1, Note 2.*
[4] See *Appendix 1, Note 3.*

dimensional configuration would meaningfully relate to construct validation measures (i.e. autonomy support, structure and control) among both coaches and athletes. Before calculating these correlations, mean scores were created for each validation measure and identified subarea by averaging the items of each validation measure and subarea. Further, we examined the correlations of the identified (sub)areas in the dimensional configuration with both coach (i.e., need satisfaction/frustration) and athlete outcomes (e.g., need satisfaction/frustration, motivation and coach evaluation).

To address our first ancillary aim, that is, examining the correspondence between athletes' and coaches' reports on (de)motivating coaching, we made use of Sample 5 only. Given the hierarchical structure of that sample, with 377 athletes nested in 41 teams, each associated with one coach, we made use of multilevel regression analyses. Specifically, in separate regression models, the coach-reports were entered as a single predictor of the corresponding athlete-reports. In addition, Multivariate Anova-analyses, we examined mean-level discrepancies between coach- and athlete-reports. Finally, to address our second ancillary aim, that is, considering the role of sport type, we used Multivariate Anova-analyses to examine mean-level differences in the identified (sub)areas as a function of sport type (i.e., individual vs. team).

Results

Primary Analyses

Dimensionality.

To investigate whether the variety of assessed coaching practices were organized along two dimensions (i.e., Hypothesis 1a), we evaluated several configurations ranging from a one-dimensional up to a six-dimensional solution produced by non-metric MDS analyses for both coaches (N = 893) and athletes (N = 377) separately. We opted for a two-dimensional instead of

single-dimensional solution because it yielded a stress loss of .040 and .036 for coaches and athletes, respectively, and because the further reduction in stress in the case of the three-dimensional solution was minimal (i.e., 006 for both coaches and athletes). Further, in both cases, the scree-test confirmed this choice by pointing towards a two-dimensional representation, thereby confirming Hypothesis 1. The first dimension of the circular pattern (i.e., the X-axis in Figure 2) can be interpreted as need thwarting, relative to need-supportive coaching with the control items (lower left quadrant) and chaos (higher left quadrant) items having negative coordinates and the autonomy support (higher right quadrant) and structure (lower right quadrant) items having positive coordinates on this dimension. The second dimension (i.e., Y-axis) can be interpreted in terms of the level of coach directiveness. All chaos items and all but one of the autonomy support items have positive coordinates on this dimension. Contrary, all control items and the majority of the structure items (i.e., 67% or n = 10) have negative coordinates on this dimension. Moreover, consistent with SDT-literature, rotating the axes resulted in two dimensions with the X-axis representing the autonomy-supportive style versus the controlling style, and the Y-axis the structuring opposite to the chaotic style. To summarize, all four a priori identified coaching styles (i.e., autonomy support, control, structure, chaos) could largely be represented in different areas by the circumplex, which were most parsimoniously captured by two overarching dimensions. All four coaching styles also showed good internal consistencies with Cronbach alpha values ranging between .78 and .87 (see Table 3), in both coach and athlete samples.

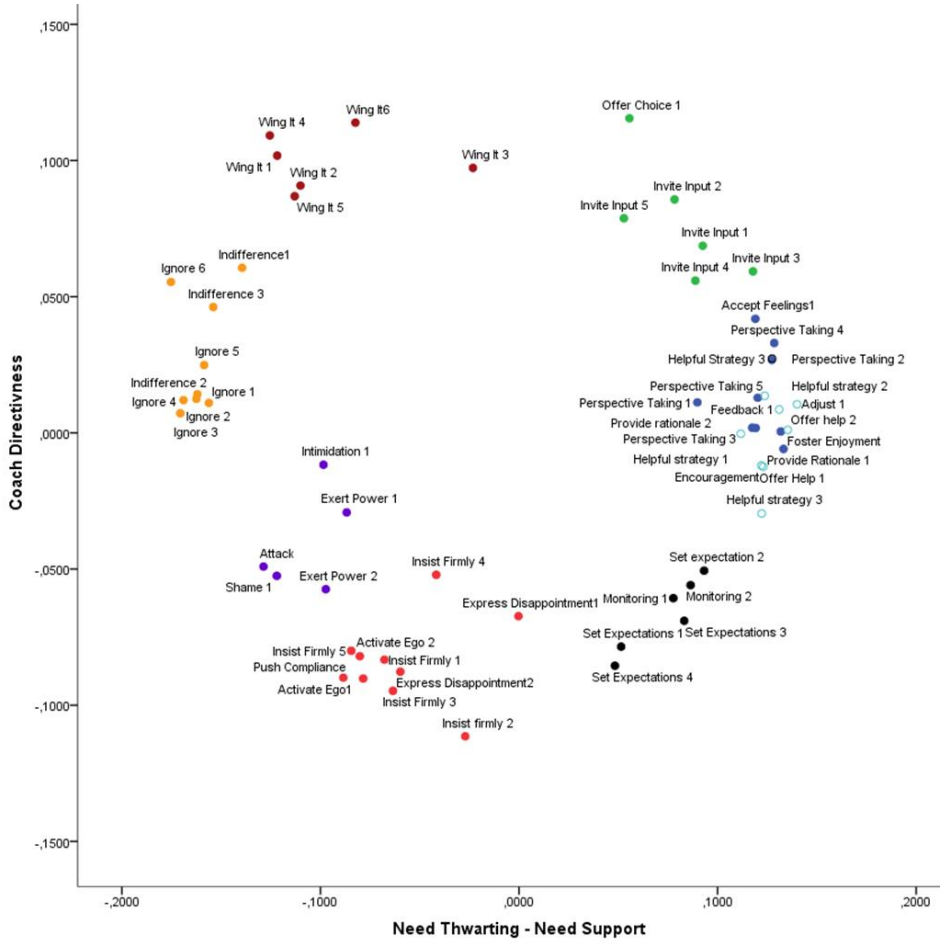

Figure 2: Two-dimensional consensus representation of the SISQ-Sport items.

Table 3: Means, standard deviants, reliabilities, and correlations between coaching styles and approaches among coaches and athletes.

	Mean	SD	α	1	2	3	4	5	6	7	8	9	10	11	12
Mean				4.22	4.82	3.70	2.93	3.99	4.37	4.68	5.02	3.97	3.14	3.00	2.82
SD				0.93	0.89	0.94	0.90	1.01	1.03	1.05	0.91	0.99	1.13	1.06	0.89
α				.86	.87	.84	.85	.63	.82	.85	.70	.78	.68	.83	.60
Styles															
1.Autonomy Support	5.13	0.78	.83	-	.79**	-.01	-.40**	.87**	.95**	.83**	.51**	.05	-.12*	-.49**	-.13*
2.Structure	5.64	0.68	.86	.68**	.-	.09	-.54**	.58**	.82**	.95**	.82**	.21**	-.14**	-.57**	-.36**
3.Control	3.02	0.96	.86	-.11**	.11**	-	.32**	-.05	.01	-.05	.33**	.95**	.84**	.34**	.19**
4.Chaos	2.29	0.68	.78	-.22**	-.39**	.34**	-	-.19**	-.48**	-.54**	-.40**	.18**	.49**	.95**	.82**
Approaches															
5.Participative	4.49	1.03	.69	.87**	.41**	-.10**	.01	-	.66**	.65**	.30**	-.02	-.07	-.30**	.06
6.Attuning	5.56	0.78	.80	.90**	.77**	-.10**	-.37**	.56**	-	.83**	.57**	.09	-.14**	-.55**	-.24**
7.Guiding	5.72	0.73	.85	.74**	.92**	-.08*	-.42**	.48**	.81**	-	.59**	.04	-.22**	-.59**	-.30**
8.Clarifying	5.51	0.81	.71	.43**	.84**	.34**	-.25**	.21**	.52**	.56**	-	.46**	.02	-.37**	-.34**
9.Demanding	3.42	1.06	.81	-.09**	.16**	.97**	.27**	-.10**	-.06	-.04	.38**	-	.63**	.21**	.07
10.Domineering	2.23	0.97	.71	-.14**	-.03	.84**	.43**	-.07*	-.16**	-.17**	.16**	.69**	-	.49**	.36**
11.Abandoning	2.09	0.76	.76	-.35**	-.42**	.40**	.91**	-.14**	-.46**	-.49**	-.21**	.33**	.46**	-	.61**
12.Awaiting	258	0.83	.54	.03	-.23**	.16**	.81**	.21**	-.13**	-.19**	-.22**	.10**	.26**	.49**	-

Note. $^{**}p < .01$, $^{***}p < .001$. Coach data below diagonal. Athlete data above diagonal.

Stability of the circumplex.

As both coach and athlete data pointed towards a two-dimensional structure, we examined whether the obtained solution would be similar across informants by applying GPA to the sample-specific configurations (i.e., Hypothesis 1b). In total 97% of the (squared) distances in the two sample-specific configurations could be represented in a single consensus configuration, indicating that the spatial representations of the individual SISQ-sport items are highly comparable between coaches and athletes. Furthermore, we correlated the coordinates of the items on both dimensions in the consensus configuration with the coordinates of the items in the separate athlete and coach configurations. The correlations appeared all significant and very high. Specifically, the need support dimension of the consensus configuration correlated, respectively, .99 and .97 with the corresponding dimension in the separate coach and athlete configurations. Next, the directiveness dimension yielded a correlation of, respectively, .99 and .97 with the corresponding dimension in the coach and athlete configuration. Together, these results indicate that the two-dimensional structure is stable across informants (i.e., coaches and athletes), which justifies further analyses with the consensus configuration. Figure 2 shows this two-dimensional consensus representation of the SISQ-sport items across samples based on the matrix of centroids.

Differentiation into subareas.

Closer inspection of the position of each item in the circumplex structure and its content revealed that each of the four broader styles (i.e., autonomy support, control, structure, chaos) fell apart into two meaningful subareas. Similar to the SISQ-education (Aelterman et al., 2018), six autonomy support items that refer to offering choice and stimulating input among athletes fell in the *participative* subarea (α_{coach} = .69; $\alpha_{athlete}$ = .63), while nine other autonomy support items fell in the *attuning* subarea and tapped into coaches' tendency to identify and nurture athletes' personal

interests take their perspective or provide a rationale (α_{coach} = .80; $\alpha_{athlete}$ = .82). Further, ten control items involving expressing disappointment and stressing athletes' duties and responsibilities by using threats and sanctions fell in the *demanding* subarea (α_{coach} = .81; $\alpha_{athlete}$ = .78), while five items referring to, shaming, guilt- and anxiety-induction, intimidation or exerting power of athletes' perspective fell into a *domineering* subarea (α_{coach} = .71; $\alpha_{athlete}$ = .68). As for structure, six items referring to communicating and monitoring expectations fell in the *clarifying* subarea (α_{coach} = .71; $\alpha_{athlete}$ = .70), while nine other structure items, which assessed coaches' offer of adjusted help, feedback, and encouragement fell in the *guiding* subarea (α_{coach} = .85; $\alpha_{athlete}$ = .85). Similarly, also chaotic items got divided in two subareas: nine items involving coaches' indifference and lack of intervention when a reaction was called for fell in the *abandoning* subarea (α_{coach} = .74; $\alpha_{athlete}$ = .81), whereas six items involving a lack of planning of the coach and letting the situation unfold itself fell in the *awaiting* subarea (α_{coach} = .61; $\alpha_{athlete}$ = .66).

To provide more formal evidence for the identification of these eight subareas, a series of confirmatory factor analyses were conducted, thereby contrasting a two- versus a one-factor solution for each pair of adjacent subareas (Hypothesis 2b). Among coaches, χ^2 change tests pointed out that a 2-factor solution appeared to yield a better fit for each of the eight pairs of adjacent subareas compared to a non-differentiated single factor solution, with $\Delta\chi^2(1)$ ranging from 6.99 to 664.74, all *p-values* $\leq$ .008. Also in the case of athletes, the more differentiated solution yielded a better fit compared to the non-differentiated solution in seven of the eight comparisons, with $\Delta\chi^2(1)$ ranging from 4.81 to 152.91, all *p-values* $\leq$ .028, with the exception of the guiding – attuning comparison ($\Delta\chi^2(1) = 0.01$, $p = .975$). In this case, the one-factor solution appeared to be more parsimonious. Yet, given that this non-differentiated solution was not systematically obtained across informants and deviates from the findings obtained in the educational domain, we chose to present the correlates of both approaches separately among athletes as well.

Possible reasons for this coach-athlete discrepancy are provided in the discussion.

Correlational Pattern.

As can be noticed in Table 3, autonomy support was positively correlated with structure among both coaches and athletes. In contrast, it correlated negatively with control in coaches, but showed a null correlation with control in athletes. Finally, structure was negatively correlated with chaos in both the coach and athlete samples, but was unrelated to control among athletes, while being positively associated with control among coaches.

Further, the correlations between the eight approaches are congruent with and provide further evidence for the circumplex structure (Hypothesis 2b). Specifically, as hypothesized, the correlations between the eight subareas followed a clear sinusoid pattern, both among coaches as well as athletes. More precisely, each coaching approach correlated most strongly with the adjacent approaches and the correlations became decreasingly positive and increasingly negative as one moves away from a specific subarea. In the athlete sample, for instance, the attuning approach correlated most strongly with the participative and the guiding approach, with the correlation dropping to zero (demanding approach) and becoming slightly negative (awaiting and domineering) and even strongly negative (abandoning) as one moves along the circumplex. A similar pattern was observed in coaches.

Table 4: Pattern of correlations of the four coaching styles and the eight approaches with outcomes among coaches.

		Styles				**Approaches**							
		Autonomy Support	Structure	Control	Chaos	Partici-pative	Attun-ing	Guiding	Clarifying	Demanding	Domineer-ing	Abandon-ing	Awaiting
Construct Validity	*N*												
Autonomy support	605	.48**	.40**	-.08*	-.17**	.43**	.42**	.45**	.22**	-.08	-.07	-.23**	-.03
Controlling	605	-.15**	-.10*	.51**	.33**	-.09	-.18**	-.19**	.05	.50**	.44**	.38**	.17**
Structure	605	.31**	.41**	.04	-.18**	.19**	.34**	.41**	.30**	.05	-.01	-.19**	-.12**
Involvement	582	.38**	.46**	-.09	-.35**	.22**	.44**	.49**	.30**	-.07	-.11**	-.38**	-.21**
Social Desirability Tendency	547	.18**	.12**	-.15**	-.18**	.14**	.17**	.20**	-.02	-.14**	-.13**	-.25**	-.01
Predictive validity[+]													
Need satisfaction	544	.26***	.24***	.04	.03	.21***	.25***	.25***	.16***	.03	.04	-.03	.10*
Need frustration	544	-.15**	-.19***	.22***	.31***	-.01	-.23***	-.23***	-.08	.21***	.20***	.32***	.21***

Note. $^{**}p < .01$, $^{***}p < .001$. [+]Partial correlations were calculated, examining the relation between a coaching style or approach and need-based functioning, controlling for social desirability.

Table 5: Pattern of correlations of the four coaching styles and the eight approaches with outcomes among athletes.

		Styles				**Approaches**							
		Autonomy Support	Structure	Control	Chaos	Partici-pative	Attun-ing	Guiding	Clarifying	Demanding	Domineer-ing	Abandon-ing	Awaiting
Construct Validitv	*N*												
Autonomy support	241	.78**	.74**	-.05	-.38**	.67**	.76**	.78**	.44**	.02	-.16*	-.46**	-.15**
Controlling	241	.05	-.06	.64**	.51**	.09	.01	-.12	.08	.55**	.65**	.48**	.43**
Structure	241	.64**	.67**	.08	-.33**	.56**	.62**	.70**	.44**	.14*	-.07	-.37**	-.16**
Predictive													
Need-based													
Satisfaction	374	.40**	.46**	-.10	-.27**	.35**	.38**	.47**	.30**	-.04	-.19**	-.29**	-.15**
Frustration	474	-.09	-.17**	.36**	.45**	-.02	-.13*	-.21**	-.05	.30**	.40**	.45**	.33**
Motivation													
Autonomous	374	.20**	.30**	-.10*	-.19**	.13*	.21**	.29**	.24**	-.05	-.17**	-.19**	-.14**
Controlled	374	.12*	.03	.32**	.29**	.18**	.07	.03	.04	.28**	.31**	.25**	.28**
Amotivation	374	-.02	-.13*	.32**	.40**	.05	-.05	-.13*	-.09	.23**	.41**	.37**	.34**
Coach Evaluation	238	.58**	.66**	-.24**	-.54**	.46**	.59**	.70**	.41**	-.14*	-.38**	-.60**	-.30**

Note. *$p < .05$, **$p < .01$, ***p < .001.

External outcomes.

Next, we examined whether the four coaching styles and the eight identified coaching approaches were meaningfully associated with other measures of autonomy support, structure and control (i.e., construct validity; cf. Hypothesis 3). Three observable patterns of correlations supported the construct validity of our newly developed measurement. First, Tables 4 and 5 show that the four coaching styles most strongly correlated with the corresponding coaching style measure in both coach and athlete samples. The structuring coaching style in athletes counts as one exception, as it correlated most strongly with autonomy support (SCQ; r = .74), closely followed by the construct validation measure of structure (TASCQ; r = .64). Second, Table 4 and 5 clearly show that the eight coaching approaches primarily correlated with the corresponding measures, and this in both coach and athlete samples. For example, autonomy support (SCQ) correlated most strongly with the participative approach and the attuning approach. The same pattern of correlations was apparent concerning the construct validation measures of structure (TASCQ) and control (CCBS). Interestingly, involvement (TASCQ) was positively correlated with the autonomy supportive and structuring style as well as with all need-supportive approaches (i.e., participative, attuning, guiding, and clarifying), while being negatively correlated with the chaotic style as well as with the need-thwarting approaches (domineering, abandoning, and awaiting).

Concerning the coach reports social desirability showed modest positive correlations with the autonomy-supportive and structuring style, while negative associations were found with the controlling and chaotic styles. Roughly the same pattern was evident concerning the eight coaching approaches, with social desirability being positively correlated with the participative, attuning, and guiding approach, but negatively with the demanding, domineering, and abandoning approach (see Table 4).

Next, we tested whether the four coaching styles and the eight coaching approaches logically correlated with both coach and athlete

outcomes. Given the high correlations between the coaching approaches and coaches' reports on social desirability, we controlled for the latter in the coach samples by calculating partial correlations. As expected, Table 4 shows that coaches' need satisfaction was positively correlated with autonomy support and structure but unrelated to control and chaos. Further, coaches' need satisfaction appeared most strongly positively related to the attuning and guiding approach, followed by the participative and clarifying approach. In contrast, coach need frustration was positively correlated with the controlling and chaotic styles, but negatively with the autonomy-supportive and structuring styles. Furthermore, the strongest positive correlation was observed for the abandoning approach, closely followed by domineering, demanding, and awaiting approach. Further moving along the circumplex, coach need frustration appeared unrelated to the demanding and participative approach, but negatively correlated with the attuning and guiding approach (Figure 3a).

Concerning the athlete outcomes, the expected pattern of results was evident (see Table 5). Athletes' need satisfaction correlated positively with both athletes' perceived autonomy-supportive and structuring coaching styles, but negatively with the perceived chaotic style. Further, the strongest positive correlation with need satisfaction was observed for the attuning and guiding approach, followed by the participative and clarifying approach. The strongest negative associations with need satisfaction emerged for the abandoning approach, followed by the domineering and awaiting approach. In general, a similar pattern was found for athletes' autonomous motivation (Figure 3a) and for coach evaluation. Contrary, athletes' need frustration was positively correlated with athletes' perceived control and chaos, but negatively with structure. Further, the strongest positive associations were observed for the abandoning and domineering approach, followed by the demanding and awaiting approach. A similar pattern emerged for controlled motivation and amotivation.

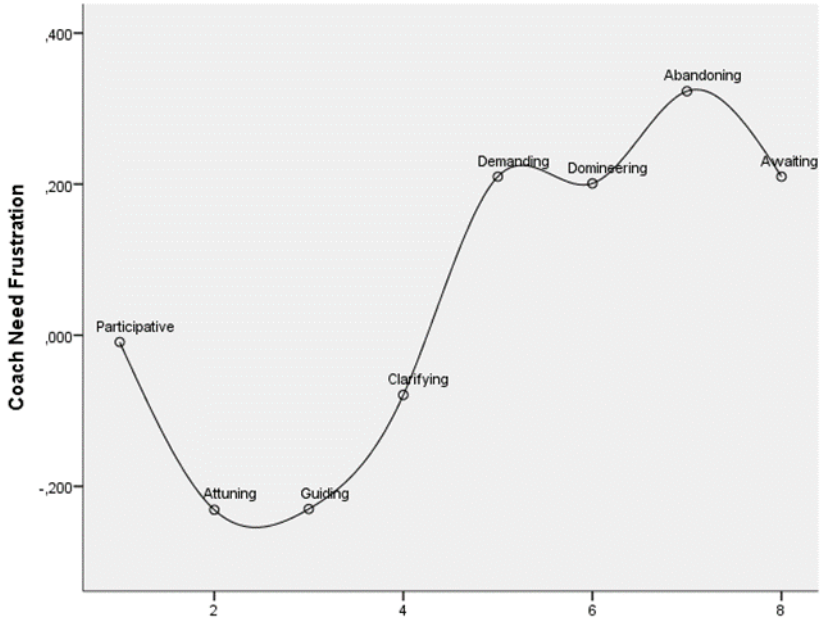

Figure 3a: Example of sinusoid relations between the eight approaches and coach outcomes

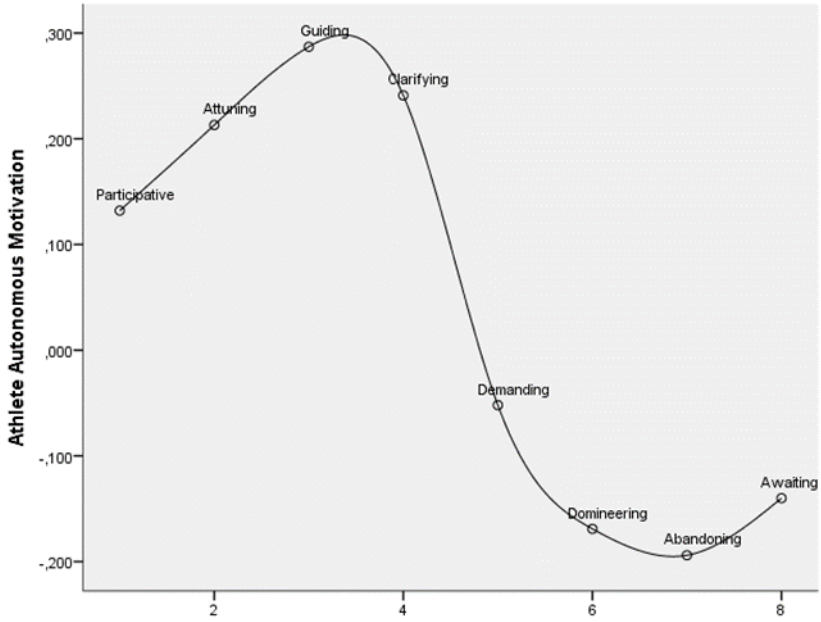

Figure 3b: Example of sinusoid relations between the eight approaches and athlete outcomes.

Ancillary Analyses

Coach-athlete convergence.

In a series of ancillary analyses in Sample 5, we examined whether athlete and coach reports would correspond to one another. Multilevel regression analyses resulted in significant correspondence between coach and athlete reports for the controlling coaching style (β = .39, $\chi^2(1) = 14.754$, $p <$ .001), but not for the autonomy-supportive (β = .26, $\chi^2(1) = 2.580$, p = .108), structuring (β = .32, $\chi^2(1) = 2.452$, p = .117), nor the chaotic coaching style (β = -.04, $\chi^2(1) = 0.091$, p = .763). As for the identified coaching approaches, correspondence was found for the demanding (β = .32, $\chi^2(1) = 11.439$, $p <$ .001), domineering (β = .39, $\chi^2(1) = 10.020$, p = .002), guiding (β = .51, $\chi^2(1)$ = 5.825, p = .016) and attuning approach (β = .46, $\chi^2(1) = 6.432$, p = .011), but not for the clarifying (β = .05, $\chi^2(1) = 0.079$, p = .779), participative (β = .06, $\chi^2(1) = 0.204$, p = .652), awaiting (β = -.13, $\chi^2(1) = 1.076$, p = .300) and abandoning approach (β = .04, $\chi^2(1) = 0.146$, p = .702).

Further, a multivariate ANOVA-analysis indicated that, across all four coaching styles and the eight identified coaching approaches, a significant mean-level difference was found, Wilk's Lambda = .498, $F(12,285.00) = 23.897$, $p <$ 001; SE = 0.502. Follow-up univariate ANOVA-analyses with Bonferroni correction pointed to coach-athlete discrepancies for all four coaching styles with coaches perceiving themselves to use a more autonomy-supportive and structuring and a less controlling and chaotic style than they were rated by their athletes (all F-values ps < .002). Further, the same pattern was evident concerning six out of the eight coaching approaches: coaches reported themselves to score significantly higher on the participative, attuning, guiding, and clarifying approach (significant F-values ps < .002) and significantly lower on the domineering and abandoning approach (significant F-values ps < .001) compared to their athletes, while no differences were found for the demanding and awaiting approach.

Difference between Type of Sport.

In a second series of ancillary analyses, we considered the role of type of sport in greater detail. Specifically, mean-level differences were examined through multivariate ANOVA analyses. In the coach data, an overall multivariate effect, Wilk's Lambda = .845, $F(12,844.00) = 12.897$, $p < 001$; SE = 0.155, was found. After taking into account Bonferroni correction, coaches of individual sports reported higher use of autonomy support and lower use of control than their colleagues in individual sports (see Table 6). At the approach level, coaches in individual sports reported greater use of the participative, but less use of the clarifying approach than coaches in team sports. Meanwhile, the latter scored higher on the demanding and domineering approach but lower on the awaiting approach than their colleagues in individual sports.

Likewise, in the athlete sample, an overall multivariate effect, Wilk's Lambda = .696, $F(12,364.00) = 13.231$, $p < 001$; SE = 0.304, was found. After Bonferroni correction, individual sport athletes perceived their coach as more autonomy-supportive, more structuring, less controlling, and less chaotic than the athletes in team sports (Table 6). Concerning the eight approaches, athletes of individual sports perceived their coach as more participative, attuning, and guiding than their counterparts in team sports. The latter however, reported their coach higher on the demanding, domineering and abandoning approaches[56].

[5] See *Appendix 1, Note 4.*
[6] See *Appendix 1, Note 5.*

Table 6: Results of Multivariate ANOVA-analyses involving type of sport as predictors among coaches and athletes.

	Coaches					**Athletes**				
	Individual sport		Team sport			Individual		Team		
	M	*SD*	*M*	*SD*	*F*(1,855)	*M*	*SD*	*M*	*SD*	*F*(1,375)
Styles										
Autonomy Support	5.24	0.78	5.05	0.77	13.10***	4.61	0.87	4.04	0.91	32.56***
Structure	5.60	0.70	5.65	0.67	1.43	5.03	0.84	4.72	0.90	10.57**
Control	2.78	0.91	3.17	0.95	36.63***	3.13	0.85	3.96	0.87	75.06***
Chaos	2.32	0.73	2.25	0.65	2.07	2.65	0.85	3.06	0.89	17.24***
Approaches										
Participative	4.70	0.98	4.34	1.03	26.29***	4.50	0.93	3.75	0.96	50.60***
Attuning	5.60	0.79	5.52	0.78	2.37	4.67	0.96	4.23	1.03	15.69***
Guiding	5.78	0.72	5.66	0.75	5.55	5.09	1.03	4.49	1.00	29.28***
Clarifying	5.32	0.85	5.64	0.77	33.55***	4.94	0.78	5.06	0.97	1.37
Demanding	3.12	1.00	3.61	1.05	46.03***	3.39	0.91	4.24	0.91	70.57***
Domineering	2.10	0.92	2.31	0.99	9.80**	2.59	0.98	3.39	1.11	46.85***
Abandoning	2.03	0.78	2.13	0.75	3.49	2.58	1.00	3.19	1.03	29.16***
Awaiting	2.75	0.88	2.43	0.77	31.72***	2.76	0.88	2.85	0.90	0.80

Note. $^{**}p < .004$, $^{***}p < .001$. Bonferroni corrected alpha value of .004.

Discussion

The topic of (de)motivating sport coaching has been heavily researched over the past few decades (e.g., Adie et al., 2012; Amorose & Anderson-Butcher, 2007; Bartholomew et al., 2010; Delrue et al., 2017). Much of this work has been grounded in Self-Determination Theory, with especially the notion of coach autonomy support and control receiving attention. However, to date research within SDT lacks a helicopter perspective shedding light on the way how different motivating (i.e., autonomy support, structure) and demotivating (i.e., control, chaos) coaching styles relate to each other. To achieve this global aim, the current study, involving two large samples of sport coaches and athletes, made use of multidimensional scaling analyses. A circumplex model emerged among both coaches and athletes, which helped to provide both more integrative and refined insight in the variety of (de)motivating coaching practices.

Towards Increased Integrative and Refined Insight

As hypothesized, the broad array of motivating and demotivating coach practices could best be summarized according to a circumplex pattern consisting of two dimensions. A first dimension denotes the extent to which coaching practices are supportive of, relative to undermining athletes' basic psychological needs for autonomy, competence, and relatedness. As shown in Figure 2, the left pole of this axis involves the controlling and chaotic practices, whereas the right pole of this axis compromises a mix of autonomy-supportive and structuring practices. The second dimension denotes the degree of coach directiveness, with either the coach or the athlete being more in charge. In the case of high directiveness, coaches typically rely on a mix of controlling or structuring practices, whereas the use of autonomy-supportive and chaotic practices leaves relatively more room for athletes to take the lead. Taken together, the two-dimensional structure divides the assessed coaching

practices into four quadrants, mainly representing the four overarching coaching styles (i.e., autonomy support, structure, control and chaos).

These findings are in line with previous work in the educational domain (Aelterman et al., 2018), in which evidence was found for the same two- dimensional structure. Further, the obtained circumplex structure appeared stable across informants (i.e., coach vs. athlete). More precisely, both coach and athlete reports of the same (de)motivating strategies point towards the same two-dimensional circumplex. Such high consensus among informants suggests that the exact location of the assessed coaching practices was very similar across coaches and athletes.

The resulting circumplex does not only produce an integrative picture, it also provides a more refined insight in how different coaching practices cluster together as both the need-supportive (i.e. autonomy support and structure) and need-thwarting styles (i.e. chaos and control) could be divided in four subareas. Each of these subareas, eight in total, involve a variety of co-occurring coaching behaviors, with the identified distinct coaching approaches relating in a sinusoid way to each other across the circumplex, supporting a gradual perspective towards coaching. That is, the difference between a specific approach and the adjacent ones is not abrupt but instead more gradual, with the differences being characterized by the extent to which a specific approach is either need-supportive or need-thwarting and the coach is high or low in directiveness. Importantly, an analogous ordered pattern of results was found when the relations between the distinguished coaching approaches and the construct validation measures as well as the external outcomes were considered (see Figure 3a and 3b).

Moving around the Circle

One of the key features of autonomy-supportive coaching involves the provision of choice and the creation of sufficient room for athletes to take initiative and to provide input and suggestions (Mageau & Vallerand, 2003). These practices fell in a distinct autonomy-supportive subarea in the circumplex labelled the *participative* approach. Interestingly, both coaches and athletes of individual, relative to those from team, sports scored higher on this approach. Presumably, in individual sports the one-to-one relation allows coaches to adopt a more individualized approach (van de Pol et al., 2015), leaving more room for athletes to voice their opinion, to make choices, and to take initiative. In contrast, for a coach of a team sport it may be more time-consuming and difficult to provide choice and input to meet the preferences of all team members. Also, intra-team problems may arise when not all choices can be respected.

Some coaches are suspicious of using participative practices as they are concerned to lose grip on their athletes and to end up with a laissez-faire style. The present findings suggest that this concern is legitimate as the participative approach is situated next to the *awaiting* approach, which is part of the overarching chaotic style. Especially coaches of individual sports adopt a more awaiting approach, presumably because they are more participative as well. When awaiting, coaches do not foresee a lot of planning and they refrain from intervening instead letting things unfold themselves. Perhaps coaches of individual sports can afford themselves such an awaiting approach more because it is easier for them to deal with opinions coming from one or a few athletes. Whereas the participative subarea was positively related to adaptive outcomes among athletes (e.g., need satisfaction), the awaiting subarea was negatively correlated with adaptive outcomes (e.g., rated coach evaluation) and positively with maladaptive outcomes (e.g., amotivation). Also, while coaches high in need frustration reported making more frequent use of an awaiting approach, those being high in need satisfaction reported being more

participative. Presumably, coaches adopting an awaiting approach are lower in energy, which may lead them to be less prepared and proactive instead being more open for what happens in the moment. Yet, the awaiting subarea may involve too little guidance and expectation setting, which helps to explain why the awaiting subarea related to higher need frustration and even a sense of helplessness and indifference (cf. amotivation) among athletes.

Moving along the circle to the other side of the participative approach, a variety of autonomy-supportive practices, such as taking the athletes' perspective and acknowledging negative affect, but also providing meaningful rationales and interesting and enjoyable exercises were found to cluster together in the *attuning* approach. For rationales to be perceived as meaningful and tasks to be interest-provoking, they are best attuned, that is, matched with athletes' personal values, convictions, and preferences. Next to the attuning subarea, the *guiding* subarea involves a variety of structuring practices, which are meant to guide athletes' competence development, such as the provision of feedback and help, encouragement, and scaffolding of tasks. As can be noticed in Figure 2, these two approaches are situated closely to each other at the far end of the need-supportive dimension. Presumably, due to their strong need-supportive nature, these subareas strongly cohere, as in sport settings, feedback and providing help (i.e., guiding) are often attuned to the developmental pace of athletes, and matched with what athletes need (i.e., attuning). Similarly, giving a meaningful rationale is often linked with feedback (e.g., to indicate why a technique should be used in a different way). Consequently, these autonomy-supportive and structuring practices may often go hand-in-hand in sport contexts. Due to their need-nurturing features, the attuning and guiding approach correlated most strongly with desirable athletes' outcomes, such as need satisfaction, autonomous motivation, and the evaluation of the coach.

Much like the autonomy-supportive dimension got differentiated into two subareas (i.e. participative and attuning), the structuring dimension also involves a second subarea, which reflects the *clarifying* approach. When

clarifying, coaches are clear about what they expect from their athletes and monitor athletes' adherence to these expectations. The clarifying approach is situated in direct opposition to the awaiting approach and coaches of team sports indicated using this approach more frequently than those of individual sports. Presumably, because they want to maintain grip of their group, coaches of team sports provide a clear framework, thereby being transparent about their expectations and guidelines and also monitoring athletes' behavior more intensively compared to coaches of individual athletes. The way how coaches set expectations and monitor progress can vary considerably though (Curran et al., 2013; Grolnick, 2012). That is, when setting expectations in a unilateral fashion, thereby pointing towards athletes' duties, and when subsequently monitoring expectations and guidelines by threatening with sanctions in case of non-compliance, coaches may be perceived as rather *demanding*. However, coaches' clarifying behavior does not by definition need to occur in a pressuring way as coaches may also combine it with more autonomy-supportive strategies. Depending on the style of clarifying, a coach may thus score high on one of the adjacent subareas of the clarifying subarea, thus displaying a combination of clarifying-guiding approach or clarifying-demanding approach.

From a conceptual perspective, this finding suggests that, more than the guiding approach, it is the clarifying approach which most easily covaries with a demanding approach, thereby pointing to a potential pitfall of clarification and monitoring. In spite of the fact that coaches are directive and thus take the lead when they are either clarifying or demanding, the associated pattern of correlates was clearly different. Among athletes, the clarifying approach was positively related to the coach evaluations, presumably because this approach allows athletes to better get their psychological needs met and fosters higher autonomous motivation. In contrast, to the extent athletes perceived their coach to be demanding, they evaluated them less positively, presumably because the demanding approach goes along with greater need frustration, controlled motivation, and amotivation. Interestingly, also

coaches' own experiences of need frustration were found to underlie coaches' reliance on a demanding approach, while experiences of need satisfaction related positively to the clarifying subarea. Future longitudinal work may want to examine whether need frustration, especially when accumulated over time, increases coaches' risk of slipping from a clarifying into a demanding approach.

When experiences of need frustration persist, coaches may further increase the pressure onto their athletes, thereby relying on a *domineering* approach. When domineering, a coach may rely on a variety of practices such as, expressing disappointment, shaming, guilt- and anxiety-induction and intimidation, which are especially applied in situations where athletes may not have complete control over the outcome of their behavior (e.g., 'When athletes display anxiety before the game'). Although positively correlated to the demanding approach, the domineering approach appears to yield more maladaptive outcomes, as manifest through its more pronounced positive relation with maladaptive outcomes (e.g., athlete need frustration) and its negative association with adaptive outcomes (e.g., ratings of coach evaluation). One reason for the more pronounced cost associated with the domineering approach might be that, while the primary target of a demanding coach is the athletes' behavior, the athlete as a person is targeted in the case of a domineering approach.

Completing the circle, a second chaotic subarea, reflecting an *abandoning* approach, was found. As the term suggests, coaches have in this case given up on their athletes, leaving them to their own devices at moments when an intervention is called for the most. Situated on the far end of the need-thwarting dimension (Figure 2), the abandoning subarea yielded the strongest positive correlates with maladaptive outcomes and the strongest negative correlates with adaptive outcomes, effects which appeared to be stronger than those observed for the domineering approach (see Table 4 and 5). From an applied perspective, it is sensible that coaches go back and forth between acting domineering and abandoning, such that they are dynamically related to

each other. That is, the use of harsh domineering practices may often be the last "resort" for coaches before giving up all together, especially if they find out that their domineering approach does not produce desired outcomes. Especially coaches of team sports may be most vulnerable to these need-thwarting approaches, presumably because it is more difficult to maintain discipline and focus of a group of athletes. Congruent with this interpretation, athletes of team sports, relative to those of individual sports, felt that their coach made significantly more use of a demotivating cocktail being demanding, domineering and abandoning. Also coaches of team sports themselves reported being more demanding and domineering.

Finally, the abandoning approach also differs from the other chaotic approach, that is, being awaiting. The abandoning approach did not only yield stronger associations with negative outcomes, but also seems to occur in different situations compared to the awaiting approach. The abandoning approach especially emerges in situations of repeated failed attempts to motivate athletes to alter their behavior, thus stemming from an underlying feeling of need frustration and even despair. In contrast, the practices that are part of the awaiting approach especially emerge in situations that coaches encounter for the first time and which they adopt a more explorative approach, while in fact more guidance may be called for in the eyes of the athletes.

Additional findings

Besides our main objective to adopt a helicopter-perspective on (de)motivating coaching, some additional findings deserve being mentioned. First, as both athletes and coaches were administered in this study, we investigated the degree of convergence between the obtained circumplex across coaches and athletes. The fact that the obtained circumplex structure as such is stable across informants (i.e., coach vs. athlete) does not imply that athletes share the opinion of their coach. Indeed, the coach-reported dimensions of autonomy support, structure, and chaos corresponded only

minimally with the same athlete-perceived dimensions. Only for the controlling coaching style in general and the two constituting approaches significant convergence was found, presumably because controlling practices are most visible (e.g., commanding and shouting can be easily noticed; see also De Meyer et al., 2014). Such a low correspondence has been reported in previous studies in the sport literature (Macquet & Stanton, 2014) and is in line with previous research using the same vignette-methodology in the educational domain (Aelterman et al., 2018). Furthermore, in terms of mean-level discrepancies, coaches scored higher on the need-supportive styles and lower on the need-thwarting styles compared to athletes. It is unclear whether coaches are overly optimistic about their motivating role or whether athletes are too critical for their coaches, an issue that could be sorted out through observational research which allows the integration of three sources of information (e.g., Aelterman, Vansteenkiste, Van den Berghe, De Meyer, & Haerens, 2014). Overall, the current results support the idea that athletes form an idiosyncratic image of coach behaviors which only minimally relates to how coaches perceive themselves (Macquet & Stanton, 2014).

Second, the obtained circumplex may create the impression that coaches' need supportive (e.g., autonomy) and need thwarting (e.g., control) behavior are to be considered as direct opposites of each other, which would be in contrast with previous work that conceptualized and studied need-supportive and need-thwarting coaching as separate dimensions (Bartholomew et al., 2011; Haerens et al., 2017; Vansteenkiste & Ryan, 2013). However, it must be noted that MDS (Borg et al., 2013) plots the relative and not the absolute distances between different coaching practices. In fact, while autonomy-supportive and controlling practices are graphically most distant from each other (relative to the other practices included), both were found to be unrelated (athletes) or only slightly negatively correlated (coaches) at the correlational level. Such findings imply that, across training and competitive context, as studied through the vignettes herein, coaches can rely on a mix of autonomy-supportive and controlling strategies. Indeed, the lack of autonomy

support by coaches does not by definition imply that they are controlling as a more active thwarting of athletes' psychological needs is required in the latter case (Bartholomew et al., 2010; Haerens et al., 2015; 2017). Likewise, the absence of coach control does not mean that coaches are actively supporting their athletes' autonomy.

Theoretical and Practical Reflections and Implications

Given the novelty of the circumplex approach used herein, the theoretical implications and the added practical value of this approach are discussed more deeply. Overall, the circumplex provides a more integrative picture as a variety of critical coaching dimensions are graphically placed in relation to each other, while simultaneously producing more refined insights as critical coaching dimensions get partitioned in subareas.

While different critical coaching dimensions have been treated as fairly distinct categories in past work, the circumplex structure suggests that a more *gradual* perspective instead of a categorical perspective to (de)motivating coaching is warranted. The idea of a gradual perspective is that not all coaching practices and approaches are equally need-supportive or need-thwarting. Specifically, some subareas of autonomy support (i.e., attuning) and structure (i.e., guiding) seem to support athletes' psychological needs more directly, which also explains their high correlation herein. Yet, different from these *need-nurturing* approaches, other autonomy-supportive (i.e., participative) and structuring (i.e., clarifying) approaches may foster need satisfaction in a more indirect way. They could be labelled to be *need-enabling* as they create the optimal conditions under which athletes can get their psychological needs met (Aelterman et al., 2018). On the other hand, as some of the specified approaches actively thwart athletes' needs and therefore can be seen as directly *need-thwarting* (e.g., abandoning, domineering), other may neither support nor thwart one's needs or motivation straightforward, but rather hinder possible need support. Instead of need-thwarting, these

approaches (e.g., awaiting, demanding) can therefore be considered as more *need-depriving*.

Next, the study of Aelterman and colleagues (2018) in the educational domain is the only precedent of the current study and, although conducted in different domains, the results of both are remarkably parallel. That is, the circumplex pattern identified by Aelterman et al. (2018) involved the same two dimensions and the same four overarching (de)motivating coaching styles, involving the same eight subareas. In both domains, the findings point to the strong complementary nature of the attuning and guiding approach. In the current athlete sample, the attuning and guiding approach could even not be factor-analytically differentiated. Presumably, as pointed out above, both set of practices are often exerted in tandem because a similar basic attitude underlies both, that is, one where the coach is trying to optimally connect to the athlete in terms of interests, preference, and perspective (attuning) or skill-level and competencies (guiding). Although some readers may question the lack of discrimination between both approaches, given that different key practices of both autonomy support and structure were carefully operationalized, we suggest that this high correlation is a finding in and of itself. Although attuning and guiding practices can be conceptually differentiated, in practice, they co-occur. Note that this high intercorrelation between autonomy support and structure do not apply to all practices equally, as the participative and clarifying approach could be clearly differentiated. When considered from a circumplex model, what is especially important is the gradual pattern of correlates between identified subareas themselves and external outcomes. Having said this, the gradual perspective on (de)motivating coaching is still in its infancy, such that future research within sport contexts is needed to substantiate the obtained circumplex and to sort out whether this configuration of subareas gets replicated.

Further, the circumplex provides deeper insights in what *motivational tailoring* looks like. That is, the beauty of motivating coaching is that coaches are capable of selecting those need-supportive strategies that fit well with both

the athlete to be motivated as well as the situation at hand. To illustrate, whereas in some situations and in front of some athletes coaches may involve athletes in the decision process (cf. participative approach), in other situations or with different types of athletes, the provision of choice may yield less desirable correlates and it may suffice to give a meaningful rationale (cf. attuning approach) for an assigned task or introduced guideline. Future work would do well to examine whether the effectiveness of motivating approaches depends on athlete characteristics (e.g., age, competence of the athlete; e.g., De Meyer et al., 2016), situational features (e.g., training vs. competition; time constraints) or even coach characteristics (e.g., experienced vs. non-experienced coaches). Along similar lines, the exact impact of need-thwarting practices may also depend on these three features. An important note is that such motivational tailoring does not equal a relativistic perspective on motivating practices (Soenens, Vansteenkiste, & Van Petegem, 2015). Indeed, it is unlikely that any athlete will experience an abandoning approach as motivating, presumably because it involves a need thwart for every athlete in any situation.

From an applied perspective, the availability of both a coach and athlete version of the SISQ-sport is interesting in two ways. First, it allows coaches to gauge the perceptions of the athletes concerning their coaching style and consequently compare both obtained profiles to detect any differences or similarities regarding their perspectives. This information may serve as a basis to start a dialogue and accustom their coaching behavior in practice. In line with this, also future work may rely on this circumplex model by observing coaches' behavior with the help of this circumplex and scoring each specific approach. Second, intervention studies on need-supportive coaching (Cheon, Reeve, Lee, & Lee, 2015) may use the SISQ-sport as a diagnostic or (self) reflection tool. After the intervention program, both self and athletes' reports may be used to identify any improvement.

Limitations

The present study has several limitations. First, given that the current study solely relied on self-report measures, future studies may complement these self-reports with observational measures. Such multi-informant research (e.g., Haerens et al. 2013; Smith et al., 2016) would be useful to directly compare athletes' and coaches' self-report to the ratings of an independent, third observer. Second, herein we focused on the dimensions of autonomy support, control, structure and chaos, thereby failing to address the role of coach relational support and neglect (see Amorose & Anderson-Butcher, 2007). One possibility is that relatedness support may emerge as a third dimension. Yet, what seems more likely is that items tapping into relatedness-supportive and relatedness-thwarting coaching strategies will be located in or around, respectively, the subareas guiding/attuning and domineering/abandoning. Third, the used correlational approach prevents one from drawing directional conclusions. Although an autonomy-supportive coaching style may be rooted in coaches' experiences of need-satisfaction, the opposite may also be true. Although coaches who experience greater need satisfaction may be more psychologically available to support their athletes' needs (Stebbings et al., 2012), enhanced need-based experiences may also result from adopting an autonomy-supportive approach towards others (Cheon, Reeve, Yu, & Jang, 2014; Deci, La Guardia, Moller, Scheiner, & Ryan, 2006). Fourth, the current study investigated mostly proximal outcomes of perceived coaching behaviors such as athlete need satisfaction/frustration and motivation. Future research may consider examining the association between the eight identified coach approaches and more distal outcomes such as athlete engagement, disengagement and performance.

Conclusion

In the last two decades, research within the context of Self-Determination Theory in sport (Bartholomew et al., 2010; Mageau & Vallerand, 2003) has studied distinct (de)motivating styles. The identification of a circumplex in the present study draws both a more refined and integrative picture as it becomes clear how different (de)motivating styles get divided in subareas and how these subareas are located in a more holistic structure. Consistent with a circumplex structure, the eight subareas, differing in their level of coach need support and coach directiveness, showed a systematic sinusoid pattern of correlates with critical external outcomes among both coaches and athletes. These finding suggest that a gradual approach towards (de)motivating coaching is warranted, with coaching approaches differing from one another in more graded instead of a black-white fashion.

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Appendix 1

Note 1.

A team of researchers and sport psychologists working in practice with athletes brainstormed multiple times about the content of vignettes and appropriate responses. A pilot version of the initial Situation-in-Sport Questionnaire, which contained 19 vignettes, was tested in sample of 599 coaches (*Mean age* = 38.35; *SD* = 12.65) and 334 athletes (*Mean age* = 15.89; *SD* = 2.07). Multidimensional scaling analyses provided promising initial evidence for the circumplex model, yet certain subareas appeared underrepresented, some vignettes and items required slight adaptations and the number of vignettes was reduced to 15 to make the questionnaire more suitable for research purposes. Vignettes were removed to obtain a balanced number of situations (i.e., 5) across the three roles of youth coaches. Further, in a small sample of 10 youth coaches, with an average of 14.20 (*SD* = 7.81) years of coaching experience, we assessed the extent to the vignettes were perceived as realistic. Average realism scores across vignettes ranged from 5.40 to 6.60 on a scale from 1 (not realistic at all) to 7 (very realistic), indicating that the selected vignettes fit with the daily coaching reality.

Note 2.

Using Euclidean distances as association measures – rather than the more common Pearson correlations, which provide the same information – has the advantage that distances can also serve as input for metrical multidimensional scaling that assumes an interval-level association.

Note 3.

While the term subarea is more technical in nature, denoting the different items that fall within a given region, the term approach is used in a more content-based way, thereby denoting the way how coaches interact with their athletes.

Note 4.

MANOVA analyses concerning gender in coach reports (N = 875, 72% male) on the 4 coaching styles and 8 coach subareas resulted in four out of 12 significant differences (F-values ranging from 0.01 to 73.03). Male coaches reported higher on the controlling style, the demanding, domineering, and clarifying subarea then female coaches. The same MANOVA analyses concerning athletes' (N = 373, 56% male) perceptions of coaching styles and subareas resulted in six out of 12 significant differences (F-values ranging from 0.04 to 28.05). Male athletes reported higher on the controlling and chaotic style, the demanding, domineering, abandoning, and awaiting subarea than female athletes.

Note 5.

In a more explorative way, it was also investigated whether the correspondence between coach-athlete ratings was moderated by the type of sport as the athlete-coach correspondence may be more elevated among athletes of individual sports. Relying on multilevel modeling, for each athlete-reported subarea separately, the interaction between the respective coach-reported subarea and sport type was entered as a predictor into the regression model. None of the interactions were found significant (Chi^2-values ranged from 0.003 to 1.800, all ps > .179).

Appendix 2

Description of the four coaching styles and eight motivational approaches based on Aelterman et al. (2018).

Coaching style	Conceptual Definition	Subarea	Description
Autonomy support	The coach's instructional goal and interpersonal tone of ***understanding***: the coach seeks to maximally identify and nurture athletes' interests, opinions and feelings, so that they can voluntarily engage in activities.	Participative	A ***participative*** coach identifies athletes' personal interests by engaging in a dialogue with athletes and inviting them to provide input and suggestions. In addition, where possible, the coach tries to offer (meaningful) choices in how athletes deal with activities and optimally follows their pace.
		Attuning	An ***attuning*** coach nurtures athletes' personal interests by trying to find ways to make the exercises more interesting and enjoyable, accepting athletes' expressions of negative affect and trying to understand athletes' perspective. The coach provides explanatory rationales that are meaningful in the eyes of athletes.
Structure	The coach's instructional goal and interpersonal tone of ***guidance***: starting from the capabilities and abilities of athletes the coach provides help and assistance, so that athletes feel competent to master skills.	Guiding	A ***guiding*** coach nurtures athletes' progress by providing appropriate help and assistance as and when needed. The coach goes through the steps that are necessary to complete a task, so that athletes can continue independently and, if necessary, can ask questions.
		Clarifying	A ***clarifying*** coach communicates expectations to athletes in a clear and transparent way and the coach monitors athletes' progress in meeting the communicated expectations.
Control	The coach's instructional goal and interpersonal tone of ***pressure***: the coach forces athletes to think, feel, and behave in a prescribed way and imposes his/her own agenda and requirements to athletes, irrespective of what athletes think.	Demanding	A ***demanding*** coach requires discipline from the athletes by using powerful and commanding language. The coach points athletes to their obligations, tolerates no contradiction, and threatens with sanctions if athletes don't comply.
		Domineering	A ***domineering*** coach exerts power to athletes to make them comply with his/her requests. The coach suppresses athletes by inducing feelings of guilt, shame and anxiety.
Chaos	The coach's instructional goal and interpersonal tone of ***laissez faire***: the coach lets athletes on their own, making it confusing for athletes what they should do, how they should behave, and how they can develop their skills.	Abandoning	After repeated interventions, an ***abandoning*** coach gives up on athletes. The coach allows athletes to just do their own thing and no longer pokes athletes to put effort, because eventually athletes have to learn to take responsibility for their own behavior.
		Awaiting	An ***awaiting*** coach offers a laissez-faire climate where the initiative fully lies with the athletes. The coach tends to wait to see how things evolve, doesn't plan too much and rather let things take their course.

Appendix 3

The Situations-In-Sport Questionnaire

In what follows 15 different situations, that often arise when coaching, are described. Underneath each situation four possible ways in which a coach might respond to each situation are listed. There are no right or wrong answers.

Please indicate which response most reflects how you reacted to similar situations throughout the season. Each of these four responses may describe what you did during competition, training sessions, during competition, or when taking up a pedagogical role. If the response listed describes what you did, circle a number close to 7. If response listed does not describe what you did, circle a number close to 1. If the response listed sort of describes what you did, circle a number close to 4.

Note: In the descriptions of the situations we refer to athletes. Feel free to interpret this in singular form (athlete), if you coach an individual sport. When a situation either never or hardly ever occurs in your sport, then we ask you to imagine how you would handle the situation if it were to occur. Please indicate which of the responses would most closely reflect your way of coaching, even if you have never actually encountered the situation personally.

SITUATION 1: An athlete is dissatisfied because of not being selected to play

You notice that an athlete is dissatisfied because s/he is not selected to play in a competition. How do you respond?

1 Describes me not at all	**2**	**3**	**4**	**5**	**6**	**7 Describes me very well**

Item	***Approach***	***Label***
1. You do not provide an explanation and leave him/her to it.	Abandoning	Ignore 1
2. You have a conversation with him/her and acknowledge his/her frustration, and give a meaningful explanation for the non-selection.	Attuning	Provide Rationale 1
3. You say: 'You need to learn to accept this. This is my decision'	Domineering	Exert Power 1
4. You indicate which steps s/he needs to take in order to be selected in the future.	Guiding	Helpful Strategy 1

SITUATION 2: An Athlete is anxious

An athlete is suffering from performance anxiety in the run-up to a competition. How do you respond?

1. You go over the steps that s/he needs to execute in order to perform well	Guiding	Helpful Strategy 2
2. You don't talk to the athlete about it. It will be gone by the competition.	Abandoning	Ignore 2
3. You ask if s/he is stressed and if they would like to talk about it.	Attuning	Accept Feelings 1
4. You say: 'You have to learn to cope with the stress. If you don't, the competition will be a disaster.'	Domineering	Intimidation

SITUATION 3: Competition warm-up

The warm-up before the competition proceeds in the following way:

1. You don't get involved in the warm-up. They know the exercises well enough from the training sessions.	Awaiting	Wing It 1
2. You tell them that you expect everyone to warm up well and be sharp.	Clarifying	Set Expectatioins 1
3. You let the athletes choose some of the warm-up exercises themselves and leave room for personal preference.	Participative	Offer Choice 1
4. You warn the athletes that they need to warm up well otherwise the competition will go badly.	Demanding	Insist Firmly 1

SITUATION 4: During a break in the competition

In the first part of the competition your athletes did not play at the level that you expected them to. During the break…

1. ...you don't say much, they know what they need to do to get back into the competition.	Awaiting	Wing It 2
2. … you give them a stern talking to: 'It's up to you now to set this right and show what you're worth'.	Demanding	Activate Ego 1
3. ... you ask their opinion and after you give them your instructions for the rest of the competition.	Participative	Invite Input 1
4. … you remind them of the exercises that you had them perform before the competition.	Clarifying	Monitoring 1

SITUATION 5: After the competition

In the run-up to an important competition you and your athletes prepare together. Although these preparations went according to plan, the competition did not go as you expected. The result you wanted was not achieved at all.

1. You say: 'We can do all the preparation we want, but if you don't do what I say then it will only end in disaster'.	Domineering	Shame 1
2. You ask your athlete why s/he thinks it didn't go so well.	Attuning	Perspective Taking 1
3. You wait to see if your athlete comes up with a solution and reacts resiliently.	Awaiting	Wing It 3
4. You tell them what you think went wrong and give suggestions for how to prevent this from happening in the future.	Clarifying	Monitoring 2

SITUATION 6: Beginning of a training session

The training session begins. You…

1. … don't plan too much. You wait and take things as they come.	Awaiting	Wing It 4
2. … are interested to hear which specific skill your athletes would like to practice and you provide the necessary space for them to do so	Participative	Invite Input 2
3. … take a strong stance that the athletes need to learn what you bring to the training session. It is your duty to give the training and it is their duty to do their best.	Demanding	Insist Firmly 2
4. ... provide a clear and easy to follow structure and you communicate the goals of the training.	Guiding	Helpful Strategy 3

SITUATION 7: Nonchalant attitude during training

A few athletes are acting indifferent during a very easy exercise and are throwing others off. What do you do in this situation to get them to put effort in.

1. You tell them what your expectations are with respect to the effort you expect them to put in during the training session.	Clarifying	Set Expectations 2
2. You explain why the exercise is important and how it contributes to their development.	Attuning	Provide Rationale 2
3. You begin another exercise in the hope that their attitude will improve.	Awaiting	Wing It 5
4. You make it clear that you are disappointed and tell them that good athletes also do things they don't feel like doing.	Demanding	Express Disappointment 1

SITUATION 8: Difficulty with a new technique

Despite repeatedly providing instructions during the past few weeks, one of your athletes still hasn't mastered a new technique. During training s/he keeps making the same technical mistake.

1. You make it clear that it's time s/he finally picks up the instructions that you have been explaining for weeks, otherwise s/he will never make it far.	Domineering	Attack
2. You ask what s/he finds difficult about the technique.	Attuning	Perspective Taking 2
3. You add in a new intermediate step to provide a way to learn the technique differently and explain that, if executed step by step, it will work.	Guiding	Adjust 1
4. You don't spend any more time on it. Enough energy has already been wasted.	Abandoning	Ignore 3

SITUATION 9: Motivating athletes to put extra effort in

You ask your athletes to perform a difficult exercise that requires extra effort.

1. You search for a new and more interesting way to explain the exercise to your athletes.	Attuning	Foster Enjoyment
2. You don't concern yourself with it too much. It's up to the athletes to decide how much effort to put in.	Abandoning	Indifference 1
3. You order them: 'There is a time to play and a time to work. Now is the time to prove what you are worth!'	Demanding	Activate Ego 2
4. You provide feedback and extra tips to make it clear to the athletes how to perform the exercise well.	Guiding	Feedback 1

SITUATION 10: An athlete is complaining during the training session

During a difficult moment in the training session an athlete begins to complain. You...

1. ... assure him/her that you are open to input and suggestions.	Participative	Invite Input 3
2. ... give him/her a helpful strategy to solve the problem step by step.	Guiding	Helpful Strategy 4
3. ... ignore the moaning and continue on as if nothing has happened.	Abandoning	Ignore 4
4. ... insist that s/he stays attentive and focused. S/he has to complete the exercise for his/her own good.	Demanding	Insist Firmly 3

SITUATION 11: A new season starts

A new season is about to begin. You are thinking about putting together some guidelines for a good cooperation. You ….

1. ... give your athletes a list of rules of conduct and possible sanctions.	Demanding	Push Compliance
2. ... do not concern yourself with rules and guidelines. You intervene when problems arise.	Awaiting	Wing It 6
3.... clearly explain the norms and expectations you have for a good cooperation.	Clarifying	Set Expectations 3
4. ... ask your athletes for their suggestions and ideas for guidelines.	Participative	Invite Input 4

SITUATION 12: Injury and rehabilitation

An athlete is injured and is undergoing rehabilitation, but it's not going smoothly. Even though you have already encouraged him/her to continue, you discover that s/he is not sticking closely enough to the rehabilitation schedule. How do you handle this?

1. You tell him/her that returning to sport after an injury is a step-by-step process and you encourage the athlete to keep it up.	Guiding	Encouragement
2. You don't get involved. S/he needs to experience the ups and downs of rehabilitation.	Abandoning	Indifference 2
3. You demand that the rehabilitation schedule is adhered to with strong discipline.	Domineering	Exert Power 2
4. You give the athlete a say in his/her rehabilitation schedule.	Participative	Invite Input 5

SITUATION 13: Argument between athletes during the training session

You notice that difficulties are forming between a few of your athletes.

1. You don't get involved. The athletes need to learn to cope with it themselves.	Abandoning	Indifference 3
2. You take the athletes in question aside and ask how they perceive the situation. You ask them to propose some possible solutions.	Attuning	Perspective Taking 3
3. You explain that co-operation within the team is important and you give them tips to solve it.	Guiding	Offer Help 1
4. You make clear that it is their duty to behave well, just like it is your duty to coach them.	Demanding	Insist Firmly 4

SITUATIE 14: Poor performance

An athlete has been underperforming for a few weeks. You have already discussed this with him/her. After another poor performance, you …

1.... point out that another poor performance is not acceptable. You tell him/her that s/he has to perform better the next time.	Demanding	Insist Firmly 5
2... don't waste any more time on it. S/he needs to get him/herself back to performance standard.	Abandoning	Ignore 5
3... give him/her some tips on how to improve his/her performance and say that you trust that s/he will improve.	Guiding	Offer Help 2
4... listen to how the athlete perceives his or her own performance and ask what s/he thinks s/he could do to improve.	Attuning	Perspective Taking 4

SITUATION 15: Arriving to training too late

An athlete arrives too late to train for the second time in a row and acts absentmindedly. What do you do?

1. After the training you take the athlete aside and ask if something is bothering him/her.	Attuning	Perspective Taking 5
2. You don't say anything about it and focus on the training instead.	Abandoning	Ignore 6
3. You make it clear in front of everyone that you are disappointed in him/her, because it is the second time that s/he came too late.	Demanding	Express Disappoint-ment 2
4. You point out that arriving on time is important to you.	Clarifying	Set Expectations 4

General overview of components per style and approach.

Style	**Autonomy Support**		**Structure**		**Control**		**Chaos**	
Approach	**Participative**	**Attuning**	**Guiding**	**Clarifying**	**Demanding**	**Domineering**	**Abandoning**	**Awaiting**
Components	Offer Choice1 Invite Input1 Invite Input2 Invite Input3 Invite Input4 Invite Input5	Provide Rationale1 Accept Feelings1 Perspective Taking1 Provide Rationale 2 Perspective Taking 2 Foster Enjoyment Perspective Taking3 Perspective Taking4 Perspective Taking5	Helpful Strategy1 Helpful strategy2 Helpful Strategy3 Adjust1 Feedback1 Helpful strategy4 Encouragement Offer help1 Offer help2	Set Expectations1 Monitoring1 Monitoring2 Set Expectations2 Set Expectations3 Set Expecations4	Insist Firmly1 Activate Ego1 Insist Firmly2 Express Disappoint-ment1 Activate Ego2 Insist Firmly3 Push Compliance Insist Firmly4 Insist Firmly5 Express Disappoint-ment2	Exert Power1 Intimidation1 Shame1 Attack Exert Power2	Ignore1 Ignore2 Ignore3 Indifference1 Ignore4 Indifference2 Indifference3 Ignore5 Ignore6	Wing It1 Wing It2 Wing It3 Wing It4 Wing It5 Wing It6
	N = 6 items	N = 9 items	N = 9 items	N = 6 items	N = 10 items	N = 5 items	N = 9 items	N = 6 items

Chapter 7

General Discussion

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The main objectives of the present dissertation were to provide a refined and integrative view on a) athletes' motivation and b) coaches' motivating style. The Achievement Goal framework (Elliot, 2005) and Self-Determination Theory (Ryan & Deci, 2000; 2017) served as theoretical basis for this dissertation. This final chapter provides an overview of the findings with respect to these two main objectives. Along the way, several propositions are offered that aim to provide a summary of a specific set of findings and as a guide for further theory development. Next, some broader indications for future research are discussed. Finally, practical implications and limitation of the present dissertation are provided, followed by a general conclusion.

1. Overview of The Findings of The Current Dissertation

1.1. Objective 1: Towards a More Refined and Integrative Insight in Athletes' Motivation

In an attempt to better understand athletes' motivation, in Chapters 2 and 3 we aimed to provide both a more integrative (Objective 1.1) and refined perspective (Objective 1.2) on athletes' achievement motivation. Here, we briefly present the findings of each chapter, followed by reflections on Objective 1.

In **Chapter 2**, we examined the reasons underlying runners' intrapersonal achievement goals (i.e., aiming to do better than before; avoiding to do worse than before) in relation to how they experienced their long-distance race. To the extent runners pursued their intrapersonal goal for autonomous reasons, they appraised the race more as a challenge and were more ambitious concerning their running time, as assessed before the race. During the race they also experienced greater need satisfaction, reported more flow and eventually obtained a faster running time. Moreover, runners' need satisfaction served as an affective mediator between their autonomous reasons for achievement goal pursuit and their experience of flow. Contrary, to the extent runners pursued the very same intrapersonal achievement goal for controlled reasons, a more conflicted experience appeared. Before the race, they appraised the situation both as a challenge and as a threat, while during the race they relied on both positive and negative self-talk, which in turn related, respectively, positively and negatively to their flow-experience during the race. As such, self-talk served as a more cognitive mediator between runners' controlled reasons for achievement goal pursuit and their flow-experience during the race.

Chapter 3 applied a diary study design to examine the within-person variability in soccer players' reasons for pursuing a task-approach goal (e.g., aiming to do as well as one possibly can). Across a series of 5 games, soccer

players' autonomous and controlled reasons for their goal pursuit appeared to vary considerably from one game to another. Furthermore, during the games in which soccer players pursued their goal for more autonomous or more controlled reasons, they appraised the upcoming game as more challenging or threatening, respectively. Finally, in case the games were appraised as threatening, players were evaluated less positively by their coach in terms of physical, tactical, and technical performance. As such, players' controlled reasons for their task-approach goal was indirectly related to their coach's performance rating via a threat appraisal of the game.

Taken together, both Chapters 2 and 3 aimed to integrate the "what" and "why" of achievement motivation (Objective 1.1) and to provide further refinement by investigating possible mediating processes between athletes' achievement motivation and outcomes (Objective 1.2.). As such in Chapters 2 and 3 an attempt was made to extend our understanding of the complexities and motivational dynamics underlying athletes' achievement goals.

1.1.1. Reflections on Objective 1

Proposition 1: Not all task and intrapersonal goals are created equal.

In spite of the differentiation between six distinct types of achievement goals (Elliot, Murayama & Pekrun, 2011), the achievement goal framework treats athletes' achievement goals that belong to a single category (e.g., interpersonal-approach goals) in a fairly homogeneous way. Yet, Chapters 2 and 3 of the present dissertation indicate that both task and intrapersonal goals can be undergirded by a variety of different reasons, some of which are more autonomous and others more controlled in nature. While the pursuit of these achievement goals was initially considered to be intertwined with reasons such as interest or challenge, the more restricted definition of achievement goals (Elliot & Thrash, 2001) resulted in the detachment of these reasons and opened the door for considering a broader

variety of reasons (Michou, Vansteenkiste, Mouratidis, & Lens, 2014; Vansteenkiste, Lens, Elliot, Soenens, & Mouratidis, 2014). The present research indicates that the consideration of the underlying reasons matters, as task and intrapersonal goals that were autonomously regulated yielded different outcomes than the same achievement goals that were pursued for controlled reasons. More precisely, when autonomously regulated, athletes feel more volitional in their pursuit, which reflects in a general positive pattern of outcomes. Contrary, under controlled reasons, athletes feel more pressured, which results in a more negative pattern of outcomes. Presumably, the same achievement goal carries a different meaning when pursued for autonomous instead of controlled reasons. (cf. *functional significance*; Deci & Ryan, 2000; Vansteenkiste, Lens, et al., 2014). As such, athletes' autonomous and controlled reasons proved an additional predictive asset next to the achievement goal pursuit itself, thereby confirming previous research in sport (e.g., Vansteenkiste, Mouratidis, & Lens, 2010) and education (e.g., Michou et al., 2014). Furthermore, the underlying reasons for athletes' task-approach goal pursuit appeared to fluctuate from game-to-game. Finally, the underlying reasons also appeared to matter for athletes' intrapersonal goal pursuit, which was not accounted for in the past. By studying the reasons and the aims of athletes' achievement goals, Chapters 2 and 3 aimed to achieve a greater *integration* of the "what" and "why" of achievement motivation in order to better account for both the direction and regulation of athlete achievement motivation, respectively.

Besides this more integrative approach, the current dissertation also provides a more refined insight in athletes' motivation. In Chapters 2 and 3 we add to the existing literature on the "what" and "why of athletes' achievement motivation by investigating the affective and cognitive processes that may link athletes' goal regulations with their experience of a competitive event. That is, in Chapter 2, both runners' need satisfaction and self-talk were found to mediate the relations between the autonomous and controlled reasons for goal pursuit and runners' flow experience. Specifically, autonomous

reasons underlying runners' intrapersonal goal pursuit was associated with more need satisfaction which, in turn, related to more flow. Controlled reasons, however, yielded positive relations with both positive and negative self-talk, which in turn related positively and negatively to runners' flow experience. Presumably, autonomous goal pursuit allows for a greater process focus, which is conducive to need satisfaction and a stronger immersion in the activity at hand. In contrast, runners with a controlled goal pursuit may be more outcome-focused and concerned about their self-esteem, which may trigger greater cognitive interference in the form of positive or negative self-talk during the race.

Further in Chapter 3, soccer players' controlled reasons for their task-approach goal were positively associated with a threat appraisal of the upcoming game, and in turn to lower performance ratings. To the best of our knowledge, there is only one similar study which addressed the mediating process in between reasons underlying achievement goals and performance, yet in a non-sport setting. In a sample of police trainees, autonomous reasons for an interpersonal-approach goal were positively associated to goal attainment through increased goal directed effort (Gillet, Lafrenière, Vallerand, Huart, & Fouquereau, 2014). The present dissertation and the study of Gillet et al. (2014) suggest a variety of cognitive (i.e., challenge and threat appraisals; positive and negative self-talk), affective (i.e., need satisfaction), and behavioral (i.e., goal directed effort) processes that could operate between autonomous and controlled regulation of goal pursuit and outcomes.

Future research may study these and other mediators, thereby considering a sequence of intervening processes. Some of these processes may take place prior to a sport event (e.g., competition appraisals), while others occur during the event (e.g., need satisfaction, self-talk, effort-expenditure). To illustrate, athletes' controlled reasons for pursuing an achievement goal may trigger a threatening appraisal, which, in turn, may elicit more negative self-talk and need frustration during task execution, leading one to more easily

disengage or underperform. Of course, each of these processes may mutually reinforce one another during task execution.

Increasing the knowledge on the intervening processes is important because it informs on possible actions that can counter the negative consequences of a more controlled goal pursuit. For example, Chapter 2 illustrates that athletes can experience a certain amount of flow despite their controlled reasons for goal pursuit. A closer look at the mediating process, however, shows that this may only be the case if they use positive self-talk (and not negative self-talk) to regulate their efforts during competition. As such, by studying the mechanisms between the "what" and "why" of achievement goals and athlete outcomes, the current dissertation adds *refinement* to the existing literature on the goals and the underlying reasons of achievement goal pursuit.

Additional findings.

Some additional notes deserve further attention regarding Chapters 2 and 3. First, in both studies, the dominant achievement goal approach (Van Yperen et al., 2006) was used to ask participants to express their goal preferences and intrapersonal-approach (e.g., aiming to do better than before) and task-approach (e.g., aiming to do as good as one possibly can) goals were overwhelmingly more popular among athletes in comparison to, for instance, interpersonal-approach (e.g., aiming to do better than others) or interpersonal-avoidance (e.g., avoiding to do worse than others) goals. This is a noteworthy observation, given the competitive nature of the sport environment. Especially in soccer (Chapter 3), where the sheer aim of the game is to outperform others and to win the game, one may expect athletes to pursue interpersonal goals more often. Importantly, as we asked athletes to indicate their most important (i.e., dominant) achievement goal for the upcoming event, we were unable to detect whether athletes may pursue a secondary achievement goal at the same time (about the multiple goal pursuit perspective, see Barron & Harackiewicz, 2001). That is, despite athletes' dominant focus on improvement or task

mastery, the interpersonal comparison may always linger in the background (Van Yperen & Leander, 2014). Future work may consider using the rank order procedure to create goal profiles, which involve a combination of the first and second rank ordered goal, to perhaps detect such a secondary interpersonal focus.

Second, although neglecting the other goals that athletes may as well pursue – yet to a lesser extent – we opted for the dominant goal approach (Van Yperen, 2006) for a number of reasons. That is, although athletes may pursue multiple achievement goals in a given game or race, we reasoned that especially the reasons underlying their most salient achievement goal may be worthwhile being considered. Indeed, if an achievement goal is rather lowly endorsed (e.g., intrapersonal-avoidance goals), it is hard for athletes to contemplate on their reasons for adhering to a non-salient achievement goal. Additionally, to avoid overburdening athletes with the same set of items tapping into reasons underlying diverse achievement goals, the questionnaire was kept short. However, the dominant goal approach also has its downside. That is, by asking the athletes to categorically indicate *whether or not* they pursue a certain achievement goal, the role of goal *strength* (i.e., the extent to which they pursue the goal) is considered in a rather "rudimentary" way. That is, as no Likert-scales are used, the variance for this categorical measure is limited, which may possibly result in an underestimation of the contribution of the "what" component in the analyses. That is, when pitting the role of the "what" versus the "why" of achievement goals as key predictors of outcomes (cf. Chapter 2), it is unfair to use a multiple item measure tapping into motives and weighing it against a single-item measure for the pursued achievement goals. Future studies may solve this limitation and slightly change the assessment approach by asking athletes to first rate on a Likert-type scale the extent to which they pursue the various achievement goals that one aims to investigate. Next, athletes could then be asked to rank order these goals and rate their underlying reasons for the adopted dominant achievement goal. Given this approach would use a continuous measure to tap into the "what"

component, the "what" and "why" components may have more equal chances to explain variance in athletes' experiences.

Third, Chapters 2 and 3 showed that a considerable amount of variance in athletes' emotional, cognitive, and behavioral outcomes is explained by the autonomous and controlled reasons underlying achievement goal pursuit. This is in line with other studies on the "what" and "why" of achievement goals in the sport and educational domain. Moreover, in some of these studies the pursuit of the aim did no longer contribute to the outcome once the underlying reasons were considered in the equation (e.g., Vansteenkiste, et al., 2010). Can we conclude then that the achievement goal construct in its restricted form (i.e., the aim) becomes redundant, or said differently, that the aim has little to add if the reasons underlying achievement goals are considered? Based on both empirical and conceptual arguments we believe this is not the case. First, given the methodological difficulties associated with the assessment approach we used in the present dissertation (see point above), any conclusions regarding the relative contribution of the "what" and "why" of achievement goals would be rather premature. Further, there is empirical evidence in which the "what" does contribute to outcomes, even when the underlying reasons are considered (e.g., Gaudreau & Braaten, 2016; Gillet et al., 2014, but also see Chapter 2). Furthermore, the pursuit of an achievement aim has been found to interact with the underlying autonomous and controlled reasons (e.g., Gaudreau & Braaten, 2016; Gillet et al., 2014). Such interaction was also found in Chapter 2 of the current dissertation. Specifically, athletes' pursuing an intrapersonal-avoidance goal appraised the upcoming competitive event even more as a threat, when their goal was pursued for highly controlled reasons. Second, although the reasons were detached from the aim (Elliot & Thrash, 2001), they both remain conceptually reliant on each other, because the one still needs the other. Indeed, the notion of *goal complexes*, as introduced by Elliot and Thrash (2001), precisely denotes the idea of their close intertwinement. While different reasons may give a different meaning to the aim, the assessment of

the reasons is also aim-dependent. That is, the reasons are assessed in a way such that they are directly linked to a specific (and no other) aim.

1.2. Objective 2: Towards a More Refined and Integrative Insight in Coaches' Motivating Style

In an attempt to move towards more integration and refinement in coaches' motivating style, Chapter 4, 5 and 6 provide a more dynamic (Objective 2.1), differentiated (Objective 2.2), and integrative (Objective 2.3) view on coaching. Here we briefly present the findings of each chapter, followed by reflections on Objective 2.

In **Chapter 4**, we used a diary design to examine game-to-game variation in athletes' perceived pre-game and on-game need-supportive and need-thwarting coaching behaviors and their relation to athletes' moral conduct towards their opponent, teammates, and the referee. As expected, players varied substantially from one game to another in their reports on their coaches' need support and need thwarting before and during the game. Interestingly, concerning the games players perceived their coach to be pressuring during the few final minutes before the game, they were more likely to objectify their opponents, and in turn, display more antisocial and less prosocial behavior towards the opponents, the referee, and the teammates during the game (as reported after the game). Furthermore, when players perceived their coach to be more need-supportive during the game, they displayed more prosocial and less antisocial behavior toward their teammates. The opposite pattern was evident concerning on-game need-thwarting coaching, which was additionally associated with more resentment toward the referee.

While **Chapter 4** focused on need-supportive and need-thwarting coaching more generally, **Chapter 5** zoomed in on the more specific coaching styles of autonomy support and control. Specifically, Chapter 5 examined by means of a 2x2 experimental vignette design, the possible influence of the

situational circumstances and athletes' motivation on the effects of specific autonomy-supportive and controlling coaching behaviors. Judokas were consecutively exposed to two vignettes, one depicting a situation in which two judokas disrupt practice and another in which two judokas struggle to master a skill. Depending on the condition judokas were randomly assigned to (between subjects design), the coach reacted in an autonomy-supportive or a controlling way. Overall, the findings revealed that judokas who were exposed to the autonomy-supportive vignettes anticipated a more positive pattern of need-based, motivational, and emotional outcomes (e.g., more need satisfaction and engagement; less need frustration, anger and oppositional defiance), than judokas exposed to the controlling vignettes. Such findings are consistent with existing empirical evidence on the benefits and hazards of autonomy support and control, respectively (e.g., Adie, Duda, & Ntoumanis, 2012; Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011, Haerens et al., 2018).

Apart from these main effects of coaches' motivating style, we also investigated the moderating role of the situational circumstances (i.e., athletes are disruptive vs. struggling) and athletes' motivation. For both situations, we found that an autonomy-supportive style yielded more optimal outcomes than a controlling style. Yet, for almost all investigated outcomes, the situational circumstances (judokas are disruptive vs. judokas are struggling) shaped the magnitude of the effects of coaching style. More precisely, coaches' controlling style appeared especially harmful when athletes struggled with a skill, while the effects appeared somewhat more moderate in cases judokas disrupted practice. The situation at hand thus affected the strength of the relation between coaching style and outcomes. In relation to the moderating role of motivation, findings revealed that the effects of coaching style were found to be largely independent of judokas' personal motivation. Only two interaction effects reached significance, both in the prediction of need satisfaction. In none of the cases, the effects of coaching style were cancelled,

let alone reversed by judokas' type of motivation. As such, the moderating role of athletes' motivation was found to be rather limited.

Chapter 6 applied a more descriptive approach to provide a panoramic view on need-supportive and need-thwarting coaching behaviors. That is, while **Chapters 4 and 5** considered a rather limited set of coaching practices, a broader array of need-supportive and need-thwarting coaching practices was assessed in **Chapter 6**, which could, based on the use of multidimensional scaling analyses, be best presented according to a circumplex pattern defined by two dimensions. A first dimension denotes the extent to which coaching practices are supportive, relative to undermining of athletes' basic psychological needs, with the autonomy-supportive and structuring styles being situated on the need-supportive end, and the controlling and chaotic coaching styles being situated at the need-thwarting end of this dimension. A second dimension denotes the degree of coach directiveness, or said differently, the extent to which either the coach or the athlete is more in charge. Controlling and structuring practices show to be high in directiveness, whereas autonomy-supportive and chaotic practices are rather low in directiveness. Together, these two dimensions divide the assessed coaching practices into four quadrants, mainly representing the four overarching coaching styles (i.e., autonomy support, structure, control and chaos). Importantly, the circumplex model also indicated that there is considerable room for refinement within each of these four overarching coaching styles, as different co-occurring coaching practices were found to cluster together into eight distinct coaching approaches (i.e., two for each overarching coaching style). This overview on coaches' need-supportive and need-thwarting coaching behaviors gives a perspective on how these behaviors are situated to one another.

Taken together, Chapter 4 demonstrated that need-supportive and need-thwarting coaching behaviors can vary dynamically between games (Objective 2.1) and that this variation logically relates to athletes' moral behavior. Further, Chapter 5, showed that the benefits of autonomy support

and the drawbacks of a controlling approach are present in different situations, and are largely independent of athletes' personal motivation. Still, the chapter provides the nuance that the situational circumstance can somewhat influence the strength of the effects of these coaching styles. As such, Chapter 5 indicates a more differentiated view on the effects of coaches' motivational style (Objective 2.2). Finally, Chapter 6, integrates knowledge on coaches' motivating style by providing a panoramic view on how different coaching styles and behaviors relate to one another (Objective 2.3). It shows that coaching styles consist of multiple coach approaches, which consist of co-occurring coaching behaviors. As such, in Chapters 4, 5 and 6, we attempted to attain more integration and refinement in coaches' motivating style.

1.2.1. Reflections on Objective 2

Proposition 2: Towards a more situation-dependent view on coaches' motivating style.

In the present dissertation, we found need-supportive coaching to be associated with athletes' positive need-based experience (i.e., more need satisfaction, less need frustration), with more qualitative motivation (e.g., more autonomous motivation, less amotivation), as well as with more engagement, and prosocial behavior, but with less defiance, anger, and antisocial behavior. Contrary, coaches' need-thwarting style was found to relate with a more negative need-based experience (i.e., less need satisfaction, more need-frustration), with less qualitative motivation (e.g., more controlled motivation and amotivation), as well as with less engagement, and prosocial behavior, but also with more defiance, anger, and antisocial behavior. Hence, the present dissertation provides support for the general positive and negative pattern of athlete outcomes associated with, respectively, need-supportive and need-thwarting coaching as found in previous research (e.g., Amorose &

Anderson-Butcher, 2007; Balaguer et al., 2012; Bartholomew et al., 2011; Haerens et al., 2018; Mageau & Vallerand, 2003).

Nevertheless, both coaches and athletes would likely agree that sport coaching is complex and the behaviors a coach displays in one situation may be (perceived) very different from those displayed in another situation. Also, following the principle of motivational tailoring, most coaches believe that some motivating behaviors are more suitable for some circumstances than others (e.g., Ng, Thøgersen-Ntoumani, & Ntoumanis, 2012). For example, athletes may experience that their coach displays different coaching styles in case of a competition, compared to training (e.g., vande Pol, Kavussanu, & Ring, 2013). In the current dissertation we found partial support for such a perspective, indicating that the situational circumstances at hand can partly influence coaches' motivating style and its effects on athletes.

First, Chapter 4 investigated athletes' perceptions from game-to-game and the results suggest that both coaches' need support and need thwarting can vary from one competitive event to the other. Such intrapersonal variation is congruent with the idea that coaches have both styles to their disposal (Haerens et al., 2018), but also suggests that they apply these styles to different degrees as a function of changing circumstances. Thus, it appears inaccurate to portray coaches in a categorical, black-white fashion, as either need-supportive or need-thwarting. Such a portrayal would not do justice to the complexity of sport coaching.

Further testifying to this complexity, Chapter 5 shows that the magnitude of the effects of autonomy-supportive and controlling coaching behaviors are partially dependent upon the specific situational circumstances at hand. More precisely, the negative effects of a controlling style appeared less harmful when used in reaction to athletes who disrupt practice, compared to when athletes struggle to master a skill. Presumably, athletes find a controlling response of the coach slightly more legitimate and therefore less harmful when they are disrupting practice (Way, 2011). After all, athletes have control over the amount of effort they put in and thus can be held accountable

for their disruptive behavior. This may, however, be less the case when athletes struggle to master a skill. As athletes' difficulty to acquire a skill may fall outside their control, being held accountable for their lack of progress may be experienced as more intrusive and, therefore, more harmful.

In line with the notion that athletes' perception of coaching behavior can be partially influenced by the situation at hand, Chapter 6 took account of the specific situation in assessing athletes' perception of their coach. That is, we developed a situation-based vignette measure to assess coaches' motivating style (i.e., the Situations-In Sport-Questionnaire; SISQ-Sport). This instrument consists of 15 vignettes that describe situations in practice and competition as well as situations in which a coach conveys rules, norms, and values to his or her athletes. For each vignette four different items reflect either an autonomy-supportive, structuring, controlling or chaotic coaching practice, which athletes (but also coaches) rate to the extent they are applicable to their coach's behaviors in the described situation. The SISQ-Sport has high ecological validity because it takes the specific situational circumstances in which coaching behaviors are conveyed into account. This contrasts with other existing measures (e.g., Sport Climate Questionnaire, Deci, 2001; Controlling Coaching Behavior Scale; Bartholomew et al., 2010), which use more generic items to assess autonomy support (e.g., "I feel that my coach provides me choices and options") and control (e.g., "My coach pays me less attention if I have displeased him/her"). Further, the SISQ-Sport taps into the motivating style of a coach in circumstances that concern coaching in competition, in practice or in situations where the coach conveys rules, norms and values to his or her athletes. As such, it is possible to determine whether coaches vary in their motivating style depending on the type of circumstances they are dealing with. To illustrate, when it comes to setting rules and guidelines before the competitive seasons starts, a coach may use a more participative approach (i.e., autonomy support) by asking athletes' input and giving them a voice in the agreements. However, once the seasons starts, a coach may act more demanding (i.e., control) by insisting on compliance when

athletes do not stick to these agreements. Such observation of intrapersonal variation may be interesting in its own right, but future research may go even further and examine the effects of such variation on athletes' experiences. That is, athletes might feel that the coach has the "right" to be more demanding in such situation, if they were consulted in the process of setting up the guidelines. After all, both coaches and athletes agreed to adhere to these agreements. Though, athletes' experience of this demanding approach may be different if the coach did not consult the athletes before the season, and instead gave them a list of rules and sanction with which athletes had to agree. Future research may want to examine such intrapersonal variation in coaches' motivating style and its effect on athlete outcomes, because it may inform coaches on why they are more effective in influencing their athletes in one situation compared to the other.

Important to note, we do not expect the effects of a need-supportive or need-thwarting coaching style on athletes' experiences to change dramatically under influence of the situational circumstances. That is, in all three chapters the benefits and harms of, respectively, need-supportive and need-thwarting coaching were clearly evident across the different situational circumstances and despite intrapersonal fluctuations in coaches' motivating style. Moreover, in the case that the situation did influence the effects of coaches' motivating style, the effects got adjusted, but never cancelled, or reversed. At the same time, the present dissertation also shows that coaching behavior does not appear in vacuum, and that there is room for gradation in these general main effects (Soenens, Vansteenkiste, & Van Petegem, 2015). Therefore, future research may consider moving on towards a more situation-dependent, and more nuanced, perspective on coaches' motivating style.

Proposition 3: Towards a more fine-grained perspective on coaches' motivating style.

In the present dissertation, we shed light on coaches' motivating styles at different levels of refinement. That is, we first examined coaches' broader need-supportive and need-thwarting styles, then their more specific autonomy-supportive and controlling style, and eventually their more fine-grained autonomy-supportive and controlling approaches.

Specifically, in Chapter 4, we tapped into coaches' need-supportive style, consisting of both autonomy-supportive and structuring coaching behaviors, and into coaches' need-thwarting style, consisting of both controlling and chaotic practices. The results provided support for the general adaptive pattern associated with need support and the typical maladaptive pattern of need thwarting. Further, Chapter 5 specifically tuned in on coaches' autonomy-supportive and controlling style and found that the maladaptive effects of the controlling style were somewhat more reduced in a specific situation (i.e., athletes disrupting practice), and somewhat more pronounced in other circumstances (i.e., athletes struggling to master a skill). Finally, Chapter 6 indicated that the autonomy-supportive and controlling coaching styles each consist of two more refined coach approaches. More precise, coaches' autonomy support can be divided into a participative approach (e.g., providing choice; inviting input), and an attuning approach (taking athletes' perspective; providing a rationale). This refinement within the autonomy-supportive style appeared especially interesting when viewed in light of their relations with athlete outcomes. That is, coaches' attuning approach appeared slightly stronger positively related with athletes' autonomous motivation and athletes' ratings of coach quality, than coaches' participative approach. Analogously, the controlling coaching style also consists of two more refined approaches: a demanding approach (e.g., activating athletes' ego; pushing for compliance) and a domineering approach (e.g., exertion of power; use of shaming tactics). Also, the latter approach appeared to relate slightly stronger

positively to athletes' controlled motivation and amotivation compared to the demanding approach. Furthermore, roughly the same fine-grained pattern of results was evident concerning the two structuring (i.e., clarifying and guiding) and the two chaotic (i.e., awaiting and abandoning) coach approaches.

Moreover, when the correlations of all eight approaches with specifically athletes' need satisfaction and frustration were considered, a remarkably fined-tuned picture emerged. Specifically, it appears that some approaches reflective of coach autonomy support (i.e., attuning) and structure (i.e., guiding) support athletes' psychological needs more directly and hence, can be considered *need-nurturing*. Yet, other autonomy-supportive (i.e., participative) and structuring (i.e., clarifying) approaches may foster need satisfaction more indirectly by for example leaving room for athletes to take initiative. Hence, they can be called *need enabling* as they create the conditions under which athletes can get their psychological needs met (Aelterman et al., 2018). Similarly, while some approaches may actively thwart athletes' needs and therefore these can be considered directly *need-thwarting* (e.g., abandoning, domineering), other may be seen as *need-depriving* (i.e., awaiting, demanding) as they neither support nor thwart athletes' needs or motivation straightforward, but rather hinder possible need satisfaction.

This fine-grained perspective may stimulate future empirical research towards more refinement. To illustrate, the controlling manipulation in Chapter 5 represented the coach using both demanding (e.g., insisting firmly on cooperation) and domineering (e.g., shaming) practices. Based on the findings of Chapter 6, future research may want to examine whether and how the effects of a "pure" demanding or a "pure" domineering coaching approach are affected by the situational circumstance in which they are conveyed. Specifically, the use of a pure domineering coach approach (e.g., guilt/shame induction, personal attack) may prove immune to the possible buffering effect of the situational circumstances, because of its highly need-thwarting nature.

That is, situational circumstances may especially alter the effects of a demanding approach. Given that a demanding approach is not directly need-thwarting but rather need-depriving, it might be the case that the negative effects of this approach diminish even further, especially in response to misbehaving athletes. Finally, future research may also want to examine how the effects of the structuring and chaotic approaches hold in different situational circumstances, following the format as used in Chapter 5.

In sum, although the literature on need-supportive and need thwarting coaching is rapidly growing (e.g., Bartholomew et al., 2011; Haerens et al., 2015; 2018), the current dissertation brings a more fine-grained perspective to the field to complement existing knowledge and to fine-tune the accumulating research.

Proposition 4: Let's not lose sight of the bigger picture.

Research on coaches' motivating style from a Self-Determination Theory perspective has long been dominated by the examination of autonomy support and control. Recently also structure, and chaos to a lesser extent, are getting the attention they deserve. The accumulating research in sport has examined the effect of specific autonomy-supportive behaviors (e.g., Deci, Eghrari, Patrick, & Leone, 1994), identified profiles of autonomy support and control (Haerens et al., 2018) and studied the combined effect of autonomy support and structure (e.g., Curran, Hill, & Niemiec, 2013). Amongst this accumulating knowledge one might lose sight on how all of these coaching styles are related to one another. Therefore, Chapter 6 provides a panoramic view on autonomy support, structure, control and chaos by presenting these styles in one circumplex model. Through this integrative picture it becomes clear that autonomy support and structure share their need-supportive character, whereas control and chaos share their need-thwarting nature. Further, autonomy support and chaos have in common that they are both low in coach directiveness. That is, both these styles leave more room for athletes

to take charge. In contrast, structure and control are characterized by the coach taking the lead in the coach-athlete interaction.

However, the circumplex model goes beyond presenting the four overarching coaching styles and displays how different co-occurring coaching practices cluster together into eight distinct coaching approaches (i.e., two for each overarching coaching style). Specifically, the autonomy-supportive style can be divided in a participative approach, (which contains practices such as offering choice and stimulating input among athletes), and an attuning approach (which includes practices such as identifying and nurturing athletes' interests, taking their perspective and providing a rationale). Further, coach control consists of a demanding approach (which involves expressing disappointment and stressing athletes' duties and responsibilities by using threats and sanctions), and of a domineering approach (with practices such as shaming, guilt- and anxiety induction, intimidation and power exertion). As for coach structure, practices described as communicating and monitoring expectations are considered as a clarifying approach, while offering help, feedback and encouragement are collected together in the guiding approach. Similarly, also the chaotic coaching style can be divided in two approaches: an abandoning approach containing coaches' indifference and lack of intervention when a reaction is called for, and an awaiting approach which refers to a lack of planning and letting the situation unfold itself.

Importantly, these identified distinct coaching approaches relate to each other in a sinusoid way across the circumplex. Such a sinusoid pattern shows that the difference between a specific approach and the adjacent ones is not abrupt but instead more gradual, with the differences being characterized by the extent to which a specific approach is either need-supportive or need-thwarting and the coach is high or low in directiveness. While different critical coaching styles have been treated as fairly distinct categories in past work (e.g., Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010; Mageau & Vallerand, 2003), the circumplex model suggests

that a more gradual perspective instead of a categorical perspective to coaches' motivating style is warranted.

Additionally, the provided circumplex model sheds new light on some existing empirical knowledge concerning coaches' motivating styles. For instance, recent empirical evidence suggests that autonomy support and structure are often highly positively correlated and when applied in tandem can form a highly "motivating cocktail" of coaching behaviors (Aelterman et al., 2018; Curran et al., 2013; Jang, Reeve, & Deci, 2010; Sierens, Vansteenkiste, Goossens, Soenens & Dochy, 2009). The current circumplex indicates that this motivating cocktail may especially combine attuning with guiding coaching practices, given the direct need-nurturing nature of these approaches. For instance, when guiding athletes towards skill development, coaches may especially foster athlete need satisfaction when they combine a helpful strategy with taking the perspective of what help athletes need. As such, the provided guidance can be attuned to what athletes need at a given moment during skill development. Future research may want to examine the need-supportive qualities of combined practices, such as attuning along with guiding.

2. Broader Indications for Future Directions

2.1. Achievement Goal Promotion

The refined and integrative view on coaches' motivating style as presented in the current dissertation, may stimulate future research to apply the same refinement and integration in coaches' motivating behaviors when considered in light of coaches' way of promoting certain achievement goals to athletes. Doing so, future research would meet the call made by Vansteenkiste, Lens, and colleagues (2014) to investigate not only the "what" and "why" of athletes' achievement goal strivings, but also the "what" and "how" of coaches' achievement goal promotion. Most empirical work today

on achievement goal promotion in sport has been covered under the term "motivational climate" (e.g., Walling, Duda, & Chi, 1993). According to this tradition, the prevailing motivational climate will influence the achievement goals athletes adopt, but also their perceptions, attitudes and behaviors in their sport environment (Walling et al., 1993). Specifically, amongst others, in a mastery-oriented climate, athletes are considered mastery-focused, adopt mastery goals, believe that effort leads to success and feel encouraged by the coach. Contrary, in a performance-oriented climate, athletes are performance-focused, adopt performance goals, are punished for mistakes, and believe that recognition and success are only for the few most talented athletes (Seifriz, Duda, & Chi, 1992). Broadly speaking, when a coach installs a mastery-oriented climate, his or her athletes are expected to adopt mastery goals, whereas when a coach installs a performance-oriented climate, athletes are more inclined to adopt performance goals.

At least two main points should be taken in to account in light of the current dissertation. First, the conceptualization of motivational climate can be considered as broad as the omnibus construct of goal orientations, which prevailed in the dichotomous achievement goal framework (Duda, 1992). Instruments commonly used to assess the motivational climate (e.g., Perceived Motivational Climate in Sport Questionnaire-2; Newton, Duda, & Yin, 2000) use items that refer to the "what" of achievement striving (e.g., "Being number one is what counts" or "The focus is to improve each game/practice"). However, also items that refer to both the "what" and the "how" are part of the assessment (e.g., "The coach gets mad when a player makes a mistake" or "The coach is happy, as long as we improve"). Future work may want to revisit this issue and see how these items can be refined so to probe solely into the achievement aims coaches are promoting to their athletes.

Second, in the same way as Self-Determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2017), can account for the reasons underlying achievement goal striving (cf. the "why"), this framework can also inform

research on the "how" in terms of need-supportive and need-thwarting style of achievement goal promotion (Vansteenkiste, Lens et al., 2014). In two experimental contributions in the educational domain, Benita and colleagues (Benita, Roth, & Deci, 2014; Benita, Shane, Elgali, & Roth, 2017) applied such a strategy. In a first experiment, a task-approach goal was induced in students by either using an autonomy-supportive, controlling or neutral style. Results indicated that in all three conditions students adopted a task-approach goal, however their experience significantly differed from each other. That is, students in the autonomy-supportive condition reported more sense of choice, interest and enjoyment compared to students in both the controlling and neutral conditions. Benita and colleagues (2017) repeated the same format this time inducing either an intrapersonal- or interpersonal-approach goal in an autonomy-supportive, controlling or neutral way. Results showed that students in the autonomy-supportive condition were better off in terms of accuracy on the experimental task and experienced pressure, compared to students in the controlling condition. Also, students in the interpersonal-approach goal condition reported slightly less pressure, compared to students pursuing an interpersonal-approach goal.

These results indicate that, besides the "what", also the "how" of achievement goal promotion is of importance concerning individuals task-experience and performance. With the provided refined insight in coaches' motivating style, the current dissertation can contribute to this line of research. Presumably, each of the eight identified coaching approaches can be applied to coaches' achievement goal promotion and even to how coaches monitor athletes' goal progress. For example, a coach can offer an athlete choice (i.e., participative coaching approach) on which specific skill to perfect in the upcoming months (i.e., task-approach goal). Such a coaching practice supports the athlete's psychological needs, which in turn leads to volitional goal pursuit of this task-based standard. However, a coach can also appoint the athlete with a skill to perfect and insist firmly that the athlete should fully commit to the appointed goal (i.e., demanding approach). Such coaching

behavior would rather thwart the athlete's needs, resulting in a more pressured goal pursuit. Apart from the different style of introducing a task-approach goal, coaches can also use a variety of coaching approaches to monitor athletes' goal progress. For example, a coach may allow the athlete to take initiative and provide input in her own performance evaluation (i.e., attuning approach). However, a coach can also show to be personally disappointed (i.e., domineering approach) when the athlete's progress is not reached.

Another interesting avenue to explore is, whether there might be certain types of achievement goals that are more easily promoted by using a certain style of goal promotion. To illustrate, an interpersonal-avoidance goal (e.g., "losing the game is no option today") may be more naturally promoted in a more need-thwarting manner, by for example inducing anxiety in athletes and stressing the negative consequences of losing the game. Contrary, when promoting an interpersonal-approach goal (e.g., "doing better than our opponent is the goal today"), a coach might more easily rely on a need-supportive style by fostering enjoyment and challenge in athletes. If indeed, for instance, avoidance achievement goals are more readily promoted in a need-thwarting manner, it may well be the case that also athletes pursue these avoidance goals more readily for controlled reasons, compared to autonomous reasons. Assuming of course that the "how" of goal promotion relates to the "why" of athletes' goal pursuit. Future research may want to explore this interplay between the "what" and "how" of coaches' goal promotion and the "what" and "why" of athletes' achievement goal pursuit.

2.2. Antecedents of Coaches' Motivating Style

Next, the current dissertation did not comment on the possible factors and processes that may precede a coaches' motivating style. Recent empirical research identified several antecedents of need-supportive and need-thwarting coaching (e.g., Rocchi & Pelletier, 2017; Rocchi, Pelletier, & Couture, 2013; Solstad, van Hoye, & Ommundsen, 2015; Stebbings, et al., 2012). Together it

appears from this research that coaches' experience of need satisfaction and frustration and their subsequent autonomous and controlled motivation explains how the perceived coaching context relates to need-supportive and need-thwarting coaching (see Rocchi et al., 2017 for an overview). The current dissertation can contribute to future studies in this emerging literature in at least two ways. First, Chapter 4 indicated that perceived need-supportive and need-thwarting coaching can vary from game to game. It logically follows, that certain variables in the coaching context that determine coaches' motivating style, may vary from game-to-game as well. For example, the evaluative pressure a coach may perceive from the context (e.g., club management, supporters, parents) to win a certain game, can vary between games depending on multiple factors such as the opponent and previous performance records. Therefore, in line with the presented dynamic perspective on coaches' need-supportive and need thwarting style, future research may examine the antecedents of coaching behaviors from a more dynamic perspective as well.

Second, the presented refined insight on coaches' motivating style opens the door for future research to investigate which of the need-thwarting coach approaches may follow from coaches' perceived pressure. More precise, the different types of pressures that a coach undergoes may cause a coach to apply different need-thwarting approaches. To illustrate, a coach in training who feels pressured because of time constraints, may try to push for compliance from her athletes (i.e., demanding approach) because there is no time to consider any other option or opinion. However, a coach who perceives evaluative pressure and/or whose self-esteem is contingent upon athletes' performance may rather resort to guilt-inducing tactics or other domineering practices to get athletes to perform. Another possibility is that a coach starts with a more demanding stance, but gradually slips into a more domineering approach and perhaps even ends up abandoning his or her athletes if the evaluative pressure and the accompanied need frustration lasts. Future experimental research may want to unravel these more fine-grained

relationships between a specific type of contextual pressure and specific coach approaches.

3. Practical Implications

In addition to its theoretical added value, the present dissertation carries a number of practical implications. First, the observation that the volitional and pressuring regulations of achievement goals can vary between games, may inform athletes, coaches, and sport psychologists that what goes well in one competitive event does not necessary repeats itself in the next. That is, although an athlete pursues a particular achievement goal during multiple consecutive games, that does not necessarily mean that the athlete's experience and performance will be constant. Therefore, a continuous vigilance concerning intrapersonal characteristics (e.g., perfectionism) and contextual variables/elements (e.g., coaching behavior) that either support athletes' autonomous functioning or puts them under pressure is warranted. However, it is fairly impossible to safeguard athletes from all internal and external pressures. Athletes may get exposed to high expectations from the fans, media, coaches and/or themselves. Furthermore, financial factors may also put athletes under pressure as their performance is sometimes directly related to monetary compensation (Reeve & Deci, 1996; Vansteenkiste & Deci, 2003; White & Sheldon, 2014). The current dissertation provides sport psychologists with important information about the affective and cognitive processes that are offset by a certain type of goal regulation. This information is a first important step to identify critical interventions that may be needed to arm athletes with the appropriate mental skills to reverse or temper the possible negative effects of such a pressuring goal pursuit. To illustrate, the pressure athletes experience concerning their achievement goal pursuit can cause athletes to perceive the upcoming game as a threat to their self-esteem. Such a threat appraisal is found to relate to somatic anxiety (e.g., Kavussanu, Dewar, & Boardley, 2014), which is typically associated with unpleasant

bodily experiences such as increased muscle tension. Sport psychologist may teach athletes relaxation exercises (Anderson, 2009; Benson, 2000; Jacobson, 1938) to overcome this negative arousal and hence, minimize performance loss. Further, the consequences of a pressuring goal pursuit may also surface during the competitive event in the form of negative self-talk. However, athletes who have learned to use positive motivational self-talk in a deliberate way (e.g., Anderson, 2009; Van Raalte et al., 1995; Van Raalte, Vincent, & Brewer, 2016), may be armed to counter the experienced pressure and safeguard their competitive experience and performance.

Second, the results of the present dissertation may raise awareness in coaches on the harmful effects of specific need-thwarting coach behaviors both in practice and competition. In fact, coaches from time-to-time may get confronted with pressuring competitive conditions, with athletes who not adhere to agreements, or who display lack of effort in practice. In these circumstance coaches may especially struggle to act in a need-supportive way, and instead turn to more directive need-thwarting behavior, such as emphasizing the importance of winning, expressing their disappointment, push for compliance and threaten with sanctions. Coaches may hope to orient athletes' attention to what is important and trigger extra effort with such approach. However, this need-thwarting behavior may backfire and result in athletes who experience less need satisfaction, who may resist complying with the coaches' request, display anger, and – in case of competition – even display antisocial behavior towards opponents or teammates. How can coaches act differently to avoid such negative consequences? In the given situation an intervention is needed, hence becoming permissive and awaiting, is certainly no option. Instead, coaches may ask questions (e.g., "How come you have difficulties giving it your all?", "How would you like to handle the upcoming game"), acknowledge athletes' feelings and provide a rationale or a helpful strategy (e.g., "I know this exercise may not be the most exciting, yet this exercise will help you with the next", "This game may get your nerves going. Perhaps focusing on your main task can help you find the needed

confidence") in an attempt to defuse the problematic situation. The results of the present dissertation strongly indicate that the latter approach may be more helpful in handling such difficult situations.

Third, the more refined and integrative view on coaches' motivating style that the present dissertation provides is easy to comprehend and intuitive to coaches, because it is very much attuned to their coaching practice of every day. Specifically, the panoramic view on coaches' motivating styles, as provided in Chapter 6, graphically represents some issues and pitfalls coaches may be confronted with in their attempt to support athletes' psychological needs on a daily basis. Therefore, the circumplex model can be applied as an educational tool to encourage a need-supportive coaching style. For instance, some coaches are reluctant of using participative practices (e.g., stimulating initiative, offering choice and asking for input), because they are concerned to lose grip on their athletes and end up with a laissez-faire environment. The circumplex model shows this concern is legitimate as these autonomy-supportive practices are situated in the participative approach, just next to the awaiting approach which is part of the overarching chaotic style. When awaiting, coaches do not foresee a lot of planning, they refrain from intervening, and let things unfold themselves. Importantly, although both approaches share the similarity of being fairly low in coach directiveness, the participative and awaiting approach are clearly different in terms of their need-supportive and need-thwarting qualities, as evidenced by their correlation with respectively, more positive and negative athlete outcomes. Hence, the circumplex model clarifies that a participative coaching approach must not be confused with a laissez-faire awaiting approach.

Fourth, the Situation-In-Sport-Questionnaire, with its situational vignettes, provides an excellent tool for coaches to reflect on their own behavior and to adopt alternative coaching behaviors in a given situation. For example, the abandoning coaching approach is situated at the far end of the need-thwarting dimension of the circumplex. Abandoning coaches have given up on their athletes, and leave them to their own devices at moments when an

intervention is called for the most. Interestingly, the SISQ-Sport informs us that such an approach predominantly seems to occur in situations of repeated attempts to motivate athletes to change their behavior and is therefore presumably rooted in need frustration and despair. Hence, coaches get to learn in what kind of situations there is danger of slipping away into an abandoning coaching approach. Besides raising awareness, the SISQ-Sport may also provide alternative coach responses in these situations in which an abandoning one looms around the corner. Specifically, when an athlete is late for practice for a second time in a row and subsequently looks distracted during training, a coach may, understandably, be fed up with it and choose to ignore the athlete completely. Such an abandoning approach would be detrimental for the athlete's psychological needs and subsequent motivation. Importantly, the SISQ-Sport provides an alternative and describes an attuning approach in this situation by taking the athlete aside after training to ask what bothers him or her. As such, the presented panoramic view and the accompanied SISQ-Sport can be both a self-reflective and educational tool for coaches.

4. Limitations

A first methodological limitation of the present work is that the dissertation mostly used a correlational design, except for Chapter 5 which used a vignette-based experimental design. Therefore, causal conclusions cannot be made. Second, most of the used samples were rather selective as mostly motivated athletes and coaches participated in the studies. Further, although athletes from a variety of individual and team sports were recruited, the individual studies consisted mostly of homogeneous samples (except for Chapter 6). Hence, caution is warranted as the findings may not generalize across different types of samples. Third, except for the use of coach-ratings of athlete performance in Chapter 4, and the examination of coach-athlete convergence in the perception of coaches' motivating style in Chapter 6, the

present dissertation relied mostly on single-informant studies, which are sensitive to the inflation of associations due to shared method-variance.

Two more issues need to be mentioned. First, the investigation of the reasons underlying achievement goal pursuit was limited to autonomous and controlled regulation. Self-Determination Theory distinguishes also amotivation, which refers to a motivational state in which athletes are not motivated to act or in which athletes act unintentionally (Ryan & Deci, 2017). Amotivation typically results either from an athlete's lack of perceived competence, or from a lack of value or interest in the behavior or activity. Specifically, an athlete may display amotivation for the goal of outperforming a particular athlete, because she does not see the value (n)or has the ability to outperform the athlete in question. Whether amotivation for achievement goal pursuit really exists, how it is developed, and what the consequences could be of such goal regulation may deserve attention in future research. Furthermore, although the current dissertation conceptualized the reasons underlying achievement goals by means of autonomous and controlled regulations, achievement goals can be pursued for a variety of reasons, outside the conceptual field of Self-Determination Theory. For instance, Jury, Darnon, Dompnier, and Butera (2017) investigated the pursuit of performance-approach goals for social utility reasons, referring to the extent to which outperforming others is considered to lead to success in society (e.g., higher degree in university; being selected for a job).

Second, the current dissertation, and especially Chapter 6, focused on the dimensions of autonomy support, control, structure and chaos, thereby not addressing the role of coaches' warm and cold coaching behaviors (see Amorose & Anderson-Butcher, 2007). These coaching behaviors may emerge in the circumplex structure as third dimension, in addition to coach need support-need thwarting and coach directiveness. Yet, it seems more likely that the relatedness-supportive and relatedness-thwarting coaching practices will be located in or around, respectively, the subareas of guiding/attuning and domineering/abandoning, and as such predominantly be defined by the need

support-need thwarting dimension. Future research may want to include these warm and cold coaching practices in the circumplex.

5. General Conclusion

The present dissertation aimed to provide a more refined and integrative insight in both athletes' motivation and coaches' motivating style. First, two empirical studies examined both the "what" and "why" of athletes' achievement goal striving. Results indicate that not all achievement goals are created equally, and that underlying reasons for goal striving can account for athletes' differential competitive experiences and performance. Second, three empirical contributions on coaches' motivating styles support the general benefits and hazards accompanied with coaches' need-supportive and need-thwarting coaching styles in terms of athletes' motivation, emotions and moral behavior. At the same time the present dissertation attunes to the complexity of sport coaching. That is, results indicate that athletes' perception of need-supportive and need-thwarting coach behaviors can fluctuate from game to game. Further, the strength of the effects of coaches' motivating behavior on athletes' motivational and emotional experiences in practice can be partially shaped by the situational circumstances in which this behavior occurs. Finally, coaches' motivating styles can be represented by a circumplex model in which the interrelations of coaching styles and the more fine-grained coaching approaches are presented in a gradual fashion. Results of the present dissertation can inform future research to investigate athletes' motivation and coaches' motivating style in a more nuanced manner.

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Summary

Towards a More Refined and Integrative View on Athletes' Motivation and Coaches' Motivating Style

Introduction

Sport participation comes with a host of physical and psychological benefits among both youth and adults. Specifically, participation in sport has been associated with better physical fitness (Larsen et al., 2017), greater self-esteem (e.g., Calfas & Taylor, 1994), and social competence (e.g., Haugen, Säfvenbom & Ommundsen, 2013), as well as fewer symptoms of depression, anxiety, and emotional distress (e.g., Asztalos, Bourdeaudhuij, & Cardon, 2009; Tomson, Pangrazi, Friedman, & Hutchison, 2003). Despite these identified benefits, sport participation may also be harmful. At least some athletes get injured (Luke et al., 2011), experience anxiety (e.g., Barber, Suhki, & White, 1999) and report feelings of exhaustion (e.g., Lonsdale, Hodge & Rose, 2009). Whether athletes benefit or, alternatively, pay a price for their sport participation may be partly traced down to *athletes' motivation* and *coaches' motivating style* (e.g., Chatzisarantis & Hagger, 2007; Ntoumanis, Taylor, & Thøgersen-Ntoumani, 2012).

Theory on athlete motivation should address two general questions, namely, *what* goal athletes are aiming at and *why* they chose that particular goal. To address these two aspects of motivational functioning, the current dissertation draws upon two well-established motivational frameworks. First, Achievement Goal Approach (Elliot, 2005), which focusses on the diversity in athletes' achievement goals. The achievement goal framework discerns six types of achievement goals, which differ in whether athletes define competence based on intrapersonal, task-based, or interpersonal standards, and whether athletes focus on approaching success or avoiding failure.

Second, Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2017), accounts for the diversity of reasons underlying athletes' sport participation and (achievement) goal pursuit. SDT distinguishes between more autonomous (i.e., volitional) reasons and more controlled (i.e., pressuring) reasons for engaging in sport and goal striving. Because each perspective emphasizes one particular aspect of athletes' motivational functioning, that is either the "*what"* or the "*why"*, integrating these frameworks becomes interesting. That is, using the strong points of one perspective to inform the other can further advance the motivational theory and enhance our understanding of the motivational processes underlying athletic activity. In sum, the current dissertation represents athletes' motivation by integrating athletes' pursued achievement goal (cf. the 'what') and their underlying reasons for striving for that particular achievement goal (cf. the 'why') (cf. Objective 1.1). By additionally investigating the mediating processes that carry the effects of athletes' achievement strivings to outcomes (cf. Objective 1.2), the present dissertation aims to provide both a refined and integrative view on athletes' motivation (cf. Objective 1).

It is widely accepted that coaches' interpersonal style of communication and behavior shapes athletes' motivation and their affective, cognitive and behavioral functioning during sport participation (e.g., Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010; Mageau & Vallerand, 2003). According to Self-Determination Theory, a coach can support or thwart athletes' basic psychological needs, and hence support or undermine athletes sport motivation and experience. Although the topic of need-supportive and need-thwarting coaching styles has received substantial attention within the Self-Determination Theory literature, at least two issues deserve further consideration. First, the literature is dominated by the investigation of coach autonomy support and control, while structuring and chaotic coaching behaviors have been mostly neglected (but see Curran et al., 2013). Furthermore, it is unclear how the former coaching styles and the behaviors they consist of relate to each other and to athlete outcomes. Second,

the complex reality of coaching learns that coaching behavior is often adjusted to the situational circumstances and therefore, it is rarely a stable coach characteristic. Therefore, the present dissertation aims to examining how athletes' perception of coaches' motivating behaviors can vary between situations (cf. Objective 2.1.) and how the situational circumstances can shape athletes' perception and their experience of these coaching behaviors (cf. Objective 2.2.). Furthermore, the current dissertation integrates the autonomy-supportive, controlling, structuring and chaotic coaching styles and the specific coaching practices they consist of, and investigates the interrelations between them and their differentiated relations with athlete outcomes (cf. objective 2.3). As such, the dissertation aims to provide also a refined and integrative view on coaches' motivating style (cf. Objective 2). The dissertation aims to achieve these objective by means of five empirical studies, using cross-sectional, repeated measures, and experimental designs.

Results and Discussion

Not all task and intrapersonal goals are created equal.

In spite of the differentiation between six distinct types of achievement goals (Elliot, Murayama, & Pekrun, 2011), the achievement goal framework treats athletes' achievement goals that belong to a single category (e.g., interpersonal-approach goals) in a fairly homogeneous way. Yet, Chapters 2 and 3 of the present dissertation indicate that both task and intrapersonal goals can be undergirded by a variety of different reasons, some of which are more autonomous and others more controlled in nature. The present research indicates that the consideration of the underlying reasons matters, as task and intrapersonal goals that were autonomously motivated yielded different outcomes than the same achievement goals that are pursued for controlled reasons. More precise, in the case of autonomous regulation of achievement goals, athletes feel more volitional in their pursuit, which reflects in a general more positive pattern of outcomes. Contrary, in the case of

controlled regulation of achievement goals, athletes feel more pressured, which results in a more negative pattern of outcomes. Presumably, the same achievement goal carries a different meaning when pursued for autonomous instead of controlled reasons (cf. functional significance; Deci & Ryan, 2000; Vansteenkiste, Lens, et al., 2014). As such, athletes' autonomous and controlled reasons proved an additional predictive asset next to the achievement goal pursuit itself, thereby confirming previous research in sport (e.g., Vansteenkiste, Mouratidis, & Lens, 2010) and education (e.g., Michou, Vansteenkiste, Mouratidis, & Lens, 2014). Furthermore, the underlying reasons for athletes' task-approach goal pursuit appear to fluctuate from game to game. Finally, the underlying reasons also appear to matter for athletes' intrapersonal goal pursuit, which was not accounted for in the past. Hence, the *integration* of the "what" and "why" of achievement motivation yields a comprehensive interpretation of both the direction and regulation of athlete achievement motivation, respectively.

Besides this more integrative approach, the current dissertation also provides a more refined insight in athletes' motivation. In Chapters 2 and 3 we add to the existing literature on the "what" and "why of athletes' achievement motivation by investigating the affective and cognitive processes that may link athletes' goal regulations with their experience of a competitive event. That is in Chapter 2, both runners' need satisfaction and self-talk simultaneously showed to mediate the relations between the reasons for goal pursuit and runners' flow experience. Based on the results it appears that autonomous goal pursuit allows for a greater process focus, which is conducive to need satisfaction and a stronger immersion in the activity at hand. In contrast, controlled motivated runners may be more outcome-focused and concerned about their self-esteem, which may trigger greater cognitive interference in the form of positive or negative self-talk during the race. Further in Chapter 3, soccer players' controlled reasons for their task-approach goal was positively associated with a threat appraisal of the upcoming game, and in turn to lower performance ratings.

Knowledge on these intervening processes can inform us on possible actions that can counter the negative consequences of a more pressuring goal pursuit. For example, Chapter 2 illustrates that controlled motivated athletes can experience a certain amount of flow despite their controlled reasons for goal pursuit. A closer look at the mediating process, however, shows that this may only be the case if they use positive self-talk (and not negative self-talk) to regulate their efforts during competition. As such, by studying the mechanisms between the "what" and "why" of achievement goals and athlete outcomes, the current dissertation adds *refinement* to the current literature on the 'what' and 'why' of achievement goal pursuit.

Towards a more situation-dependent view on coaches' motivating style.

In the present dissertation, we found need-supportive coaching to be associated with athletes' positive need-based experience (i.e., more need satisfaction, less need frustration), with more qualitative motivation (e.g., more autonomous motivation, less amotivation), as well as with more engagement, and prosocial behavior, but with less defiance, anger, and antisocial behavior. Contrary, coaches' need-thwarting style was found to relate with a more negative need-based experience (i.e., less need satisfaction, more need-frustration), with less qualitative motivation (e.g., more controlled motivation and amotivation), as well as with less engagement, and prosocial behavior, but also with more defiance, anger, and antisocial behavior. Hence, the present dissertation provides support for the general positive and negative pattern of athlete outcomes associated with, respectively, need-supportive and need-thwarting coaching as found in previous research (e.g., Amorose & Anderson-Butcher, 2007; Balaguer et al., 2012; Bartholomew et al., 2011; Haerens et al., 2018; Mageau & Vallerand, 2003).

Nevertheless, both coaches and athletes would likely agree that sport coaching is complex and the behaviors a coach displays in one situation may be (perceived) very different from those displayed in another situation. For

example, athletes may experience that their coach displays different coaching styles in case of a competition, compared to training (e.g., vande Pol, Kavussanu, & Ring, 2013). The current dissertation confirms such a situational perspective on coaching. First, Chapter 4 investigated athletes' perceptions from game-to-game and the results suggest that both coaches' need support and need thwarting can vary from one competitive event to the other. Such intrapersonal variation is congruent with the idea that coaches have both styles to their disposal (Haerens et al., 2018), but also suggests that they apply these styles to different degrees in one game compared to the other. Furthermore, during the games that athletes perceived their coach as more need-supportive or need-thwarting, they were inclined to display more prosocial or, respectively, more antisocial behavior towards opponents, the referee and the team mates. Thus, it appears inaccurate to exclusively classify or portray coaches as either need-supportive or need-thwarting, as such would not do justice to the complexity of sport coaching.

Further testifying to this complexity, Chapter 5 shows that the magnitude of effects of autonomy-supportive and controlling coaching behaviors can – to a certain extent – be shaped by the specific situational circumstances in which the behaviors are conveyed. More precisely, the negative effects of a controlling style appeared less harmful when used in reaction to athletes who disrupt practice, compared to when athletes struggle to master a skill. Presumably, athletes find a controlling response of the coach slightly more legitimate and therefore less harmful when they are disrupting practice (Way, 2011).

In line with the notion that athletes' perception of coaching behavior can be partially influenced by the situation at hand, Chapter 6 took account of the specific situation in assessing athletes' perception of their coach. That is, we developed a situation-based vignette measure to assess coaches' motivating style (i.e., the Situations-In Sport-Questionnaire; SISQ-Sport). This measure consists of 15 vignettes that describe situations in practice and competition as well as situations in which a coach conveys rules, norms and

values to his or her athletes. For each vignette four different items reflect either an autonomy-supportive, structuring, controlling or chaotic coaching practice, which athletes (but also coaches) rate to the extent they are applicable to their coach's behaviors in the described situation. The SISQ-Sport has high ecological validity, because it takes into account the specific situational circumstances in which coaching behaviors are conveyed. Further, the SISQ-Sport taps into the motivating style of a coach in circumstances that concern coaching in competition, in practice or in situations where the coach conveys rules, norms and values to their athletes. As such, it is possible to assess whether coaches vary in their motivating style depending on the type of circumstances they are dealing with.

Important to note, in all three chapters the benefits and harms of, respectively, need-supportive and need-thwarting coaching were clearly evident across the different situational circumstance and despite intrapersonal fluctuations in coaches' motivating style. Moreover, in the case that the situation did influence the effects of coaches' motivating style, the effects got adjusted, but never cancelled, or reversed. At the same time, the present dissertation also shows that coaching behavior does not appear in vacuum, and that there is room for gradation in these general main effects (Soenens, Vansteenkiste, & Van Petegem, 2015). Therefore, future research may consider moving on towards a more situation-dependent, and more nuanced, perspective on coaches' motivating style.

Towards a more fine-grained perspective on coaches' motivating style.

In the present dissertation, we shed light on coaches' motivating styles at different levels of refinement. That is, we first examined coaches' broader need-supportive and need-thwarting styles, then their more specific autonomy-supportive and controlling style, and eventually their more fine-grained autonomy-supportive and controlling approaches.

Specifically, in Chapter 4, we tapped into coaches' need-supportive style, consisting of both autonomy-supportive and structuring coaching behaviors, and into coaches' need-thwarting style, consisting of both controlling and chaotic practices. The results, provided support for the general adaptive pattern associated with need support and the typical maladaptive pattern of need thwarting. Further, Chapter 5 specifically tuned in on coaches' autonomy-supportive and controlling style and found that the maladaptive effects of the controlling style were somewhat more reduced in a specific situation (i.e., athletes disrupting practices), and somewhat more pronounced in other circumstances (i.e., athletes struggling to master a skill). Finally, Chapter 6 indicated that the autonomy-supportive and controlling coaching styles each consist of two more refined coach approaches. More precise, coaches' autonomy support can be divided into a participative approach (e.g., providing choice; inviting input), and an attuning approach (taking athletes' perspective; providing a rationale). This refinement within the autonomy-supportive style appeared especially interesting when viewed in light of their relations with athlete outcomes. That is, coaches' attuning approach appeared slightly stronger positively related with athletes' autonomous motivation and athletes' ratings of coach quality, than coaches' participative approach. Analogously, the controlling coaching style also consists of two more refined approaches; a demanding approach (e.g., activating athletes' ego; pushing for compliance) and a domineering approach (e.g., exertion of power; use of shaming tactics). Also, the latter approach appeared to relate slightly stronger positively to athletes' controlled motivation and amotivation compared to the demanding approach. Furthermore, a comparable fine-grained pattern of results was evident concerning the two structuring (i.e., clarifying and guiding) and the two chaotic (i.e., awaiting and abandoning) coach approaches.

Moreover, when the correlations of all eight approaches with specifically athletes' need satisfaction and frustration were considered, a remarkably fined-tuned picture emerged. Specifically, it appears that some

approaches within autonomy support (i.e., attuning) and structure (i.e., guiding) support athletes' psychological needs more directly and hence, can be considered *need-nurturing*. Yet, other autonomy-supportive (i.e., participative) and structuring (i.e., clarifying) approaches may foster need satisfaction more indirectly. Hence, they can be called *need enabling* as they create the conditions under which athletes can get their psychological needs met (Aelterman et al., 2018). Similarly, while some approaches may actively thwart athletes' needs and therefore can be considered directly *need-thwarting* (e.g., abandoning, domineering), other may be seen as *need-depriving* (i.e., awaiting, demanding) as they neither support nor thwart athletes' needs or motivation straightforward, but rather hinder possible neesatisfaction.

In sum, although the literature on need-supportive and need thwarting coaching is rapidly growing (e.g., Bartholomew et al., 2011; Haerens et al., 2015; 2018), the current dissertation brings a more fine-grained perspective to the field to complement existing knowledge and to fine-tune the accumulating research.

Let's not lose sight of the bigger picture.

Research on coaches' motivating style from a Self-Determination Theory perspective has long been dominated by the examination of the autonomy support and control. Recently, also structure and to a lesser extent chaos are getting the attention they deserve. Due to the accumulating knowledge on coaches' motivating styles, one might lose sight on how these coaching styles are related to one another. Therefore, Chapter 6 provides a panoramic view on autonomy support, structure, control and chaos by presenting these styles in one circumplex model. Through this integrative picture it becomes clear that autonomy support and structure share their need-supportive character, whereas control and chaos share their need-thwarting nature. Further, autonomy support and chaos have in common that they are both low in coach directiveness. That is, both these styles leave more room for

athletes to take charge. In contrast, structure and control are characterized by the coach taking the lead in the coach-athlete interaction.

However, the circumplex model goes beyond presenting the four overarching coaching styles and displays how different co-occurring coaching practices cluster together into eight distinct coaching approaches (i.e., two for each overarching coaching style). Importantly, these identified distinct coaching approaches relate to each other in a sinusoid way across the circumplex, indicating a more gradual perspective towards coaching. Such a sinusoid pattern indicates that the difference between a specific approach and the adjacent ones is not abrupt but instead more gradual, with the differences being characterized by the extent to which a specific approach is either need-supportive or need-thwarting and the coach is high or low in directiveness. While different critical coaching dimensions have been treated as fairly distinct categories in past work (e.g., Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010; Mageau & Vallerand, 2003), the current circumplex model suggests that a more gradual perspective instead of a categorical perspective to coaches' motivating style is warranted.

Conclusion

The present dissertation aimed to provide a more refined and integrative insight in both athletes' motivation and coaches' motivating style. First, two empirical studies examined both the "what" and "why" of athletes' achievement goal striving. Results indicate that not all achievement goals are created equally, and that underlying reasons for goal striving can account for athletes' differential competitive experiences and performance. Second, three empirical contributions on coaches' motivating styles support the general benefits and hazards accompanied with coaches' need-supportive and need-thwarting coaching styles in terms of athletes' motivation, emotions and moral behavior. At the same time the present dissertation attunes to the complexity of sport coaching. That is, results indicate that athletes' perception of need-

supportive and need-thwarting coach behaviors can fluctuate from game to game. Further, the strength of the effects of coaches' motivating behavior on athletes' motivational and emotional experiences in practice can be partially shaped by the situational circumstances in which this behavior occurs. Finally, coaches' motivating styles can be represented by a circumplex model in which the interrelations of coaching styles and the more fine-grained coaching approaches are presented in a gradual fashion. Results of the present dissertation can inform future research to investigate athletes' motivation and coaches' motivating style in a more nuanced manner.

Nederlandstalige Samenvatting

Naar een Meer Verfijnde en Geïntegreerde Visie op de Motivatie van Atleten en de Motiverende Stijl van Coaches

Introductie

Sportparticipatie gaat gepaard met een resem aan fysieke en psychologische voordelen voor zowel jongeren als volwassenen. Meer bepaald wordt sportparticipatie in verband gebracht met meer fitheid (Larsen et al., 2017), meer zelfvertrouwen (vb. Calfas & Taylor, 1994), en sociale competentie (vb. Haugen, Säfvenbom & Ommundsen, 2013), en minder emotioneel leed, minder symptomen van depressie en angst (vb. Asztalos, Bourdeaudhuij, & Cardon, 2009; Tomson, Pangrazi, Friedman, & Hutchison, 2003). Ondanks deze voordelen, kan sportbeoefening ook schadelijk zijn. Namelijk, sommige atleten ondergaan de negatieve kant van sportparticipatie en geraken geblesseerd (Luke et al., 2011), vertonen competitie-angst (vb. Barber, Suhki, & White, 1999) of ervaren burn-out (vb. Lonsdale, Hodge, & Rose, 2009). Of atleten de vruchten plukken van, dan wel, de prijs betalen voor hun sportbeoefening hangt gedeeltelijk af van *hun eigen motivatie* en de *motiverende stijl van hun coach* (Chatzisarantis & hagger, 2007; Ntmounais, Taylor, & Thøgersen-Ntoumani, 2012).

Een theorie die de motivatie van atleten wil capteren, moet twee algemene vragen beantwoorden, *wat* voor doel atleten nastreven en *waarom* ze precies dat doel kiezen. Het huidige proefschrift beroept zich op twee motivationele raamwerken die doorgaans elk, onafhankelijk van elkaar, één van deze vragen aanpakt. Ten eerste, de Prestatiedoelbenadering (Elliot, 2005), die focust op de diversiteit aan prestatiedoelen die atleten kunnen nastreven. De Prestatiedoelbenadering onderscheidt zes soorten

prestatiedoelen, die verschillen in functie van de mate waarin atleten competentie definiëren op basis van intrapersoonlijke, taak-, of interpersoonlijke standaarden, maar ook de mate waarin atleten gericht zijn op het behalen van succes of het vermijden van falen.

Ten tweede, de Zelfdeterminatietheorie (Deci & Ryan, 1985; Ryan & Deci, 2017), die de diverse redenen onderliggend aan atleten hun sportparticipatie en doelstreven behandelt. De Zelfdeterminatietheorie onderscheidt meer autonome (d.i. vrijwillige) redenen van meer gecontroleerde (d.i. gedwongen) redenen onderliggend aan hun sportengagement en doelstreven. Omdat elk van deze perspectieven de nadruk legt op slechts een deel van het motivationeel proces, namelijk oftewel het "what" oftewel het "waarom", is het net bijzonder interessant om deze raamwerken te integreren. Het gebruiken van de sterke punten van het ene perspectief om het andere perspectief te versterken, laat ons toe om de theorie rond motivatie verder te optimaliseren en ons begrip van de motivationele processen onderliggend aan sportbeoefening uit te breiden. Samengevat, bekijkt het huidig proefschrift de prestatiedoelen van atleten (cf. het "wat") en de onderliggende reden voor het nastreven van die prestatiedoelen (cf. het "waarom") op een geïntegreerde wijze (objectief 1.1). Door bijkomend de mediërende processen te onderzoeken die de effecten van het prestatiedoelstreven van atleten op hun uitkomsten kunnen verklaren (cf Objectief 1.2), probeert het huidig proefschrift een meer verfijnde en geïntegreerde visie op de motivatie atleten te geven (cf. Objectief 1).

Het is algemeen aanvaard dat de interpersoonlijke stijl van communicatie en gedrag van coaches de sportbeleving en motivatie van atleten vormgeeft (vb. Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010; Mageau & Vallerand, 2003). Volgens de Zelfdeterminatietheorie, kan de coach de psychologische basisbehoeften van zijn/haar atleten ondersteunen of ondermijnen en op die manier ook de kwaliteit van hun motivatie en hun sportbeleving positief of negatief beïnvloeden. In de literatuur gebaseerd op de Zelfdeterminatietheorie heeft het onderwerp van behoefte-ondersteunende

en behoefte-ondermijnende coachingstijlen veel aandacht gekregen. Toch kunnen er nog twee grote vraagstukken overwogen worden. Ten eerste is de literatuur beheerst door onderzoek omtrent autonomie-ondersteuning en controle, terwijl de structurerende en de chaotische coach gedragingen grotendeels genegeerd werden in de sportliteratuur. Daarnaast is het vandaag onduidelijk hoe deze coachingstijlen en de gedragingen waaruit ze bestaan in relatie staan met elkaar en met de beleving van de atleet. Ten tweede leert de complexe realiteit van coaching ons dat coachgedrag vaak aangepast is aan de situationele omstandigheden en dat het daarom zelden een stabiele coacheigenschap is. Het voorliggende proefschrift wil daarom nagaan hoe het motiverend gedrag van een coach kan variëren tussen situaties (cf. Objectief 2.1) en hoe de situationele omstandigheden de perceptie en de ervaring van atleten betreffende het coachgedrag kan beïnvloeden (cf. Objectie 2.2). Verder integreert het proefschrift zowel de autonomie-ondersteunende, controlerende, structurerende en chaotische coachingstijlen, én de coachgedragingen waaruit ze bestaan, in één studie om te onderzoeken hoe ze met elkaar gerelateerd zijn en hoe ze gedifferentieerd gerelateerd zijn aan de uitkomsten van atleten (2.3). Op deze manier probeert het huidig proefschrift ook een verfijnd en geïntegreerd perspectief op de motiverende stijl van coaches te bieden (cf. Objectief 2). Het proefschrift wil deze objectieven nastreven doormiddel van vijf empirische studies, die samen gebruik maken van een cross-sectionele opzet, herhaalde metingen, en een experimenteel design.

Resultaten en Discussie

Niet alle taak- en intrapersoonlijke doelen zijn gelijk.

Hoewel de Prestatiedoelbenadering zes verschillende doelen onderscheidt (Elliot, Murayama, & Pekrun, 2011), behandelt het raamwerk de prestatiedoelen van atleten die tot dezelfde categorie behoren (vb. interpersoonlijk-toenaderingsdoel) op een vrij homogene wijze. Echter,

Hoofdstukken 2 en 3 geven aan dat zowel intrapersoonlijke doelen als taakdoelen nagestreefd kunnen worden voor diverse redenen. Sommige van die redenen zijn autonoom en andere meer gecontroleerd van aard. Het huidig onderzoek geeft aan dat de onderliggende redenen ertoe doen, want de intrapersoonlijke doelen en taakdoelen die autonoom gemotiveerd waren vertoonden verschillende uitkomsten dan die doelen die nagestreefd werden voor meer gecontroleerde redenen. Met name ervaren atleten meer psychologische vrijheid onder invloed van autonome regulatie, wat gereflecteerd wordt in een algemeen positief patroon van uitkomsten. Daarentegen voelen atleten meer druk onder de invloed van gecontroleerde redenen, wat resulteert in een negatiever patroon van uitkomsten. Verondersteld wordt dat hetzelfde prestatiedoel een verschillende betekenis draagt wanneer het voor autonome redenen in plaats van gecontroleerde redenen wordt nagestreefd (cf. functionele betekenis; Deci & Ryan, 2000; Vansteenkiste, Lens, et al., 2014). De autonome en gecontroleerde redenen van atleten bleken in het huidig proefschrift een extra voorspellende kracht, naast het prestatiedoelstreven op zich. Daarmee bevestigt het proefschrift voorgaand onderzoek in sport (vb. Vansteenkiste, Mouratidis, & Lens, 2010) en educatie (vb. Michou, Vansteenkiste, Mouratidis, & Lens, 2014). Meer nog, de onderliggende redenen voor een taaktoenaderingsdoel bleken te fluctueren van wedstrijd tot wedstrijd. Tot slot, geeft het huidig proefschrift aan dat de autonome en gecontroleerde redenen onderliggend aan doelstreven ook van belang zijn in het geval atleten een intrapersoonlijk doel kiezen, een soort doel dat in het verleden nog nauwelijks onderzocht werd. Dus, de *integratie* van het “wat” en het “waarom” van prestatiemotivatie resulteert in een omvattende interpretatie van zowel de richting als de regulering van de prestatiemotivatie van atleten.

Behalve deze meer geïntegreerde benadering, biedt het huidig proefschrift ook een meer verfijnd inzicht in de motivatie van atleten. Met Hoofdstukken 2 en 3 dragen we bij tot de bestaande literatuur betreffende het “wat” en het “waarom” van het prestatiestreven van atleten, door de affectieve

en cognitieve processen te onderzoeken die het prestatiedoelstreven van atleten kunnen linken met de ervaringen die ze hebben tijdens competitie. Namelijk, in Hoofdstuk 2 medieerden zowel de behoeftebevrediging als de zelfspraak van lopers de relatie tussen de redenen onderliggend aan hun doelstreven en hun ervaring van flow tijdens de wedstrijd. Op basis van de resultaten, lijkt het erop dat autonoom doelstreven zorgt voor een focus op het proces die bijdraagt tot behoeftebevrediging en de mate waarin men opgaat in de activiteit. Daartegenover, lijken gecontroleerd gemotiveerde lopers meer gefocust op de uitkomst van de wedstrijd en begaan met hun eigen zelfbeeld. Dit kan ervoor zorgen dat deze lopers tijdens de wedstrijd meer cognitieve interferentie ervaren in de vorm van positieve of negatieve zelfspraak. In Hoofstuk 3 bleken de gecontroleerde redenen van voetballers voor een taak-toenaderingsdoel geassocieerd met de perceptie dat de wedstrijd een bedreiging vormt voor hun zelfbeeld. Bijgevolg werd de prestatie van deze voetballers minder positief beoordeeld door hun coach.

De kennis betreffende deze interveniërende processen kan ons informeren over mogelijke acties die de negatieve gevolgen van prestatiedoelstreven onder druk kunnen counteren. Bijvoorbeeld, Hoofdstuk 2 geeft aan dat gecontroleerd gemotiveerde atleten, ondanks de druk die ze voelen omtrent hun doelstreven, wel degelijk een zekere mate van flow kunnen ervaren tijdens de wedstrijd. Echter, wanneer we de mediërende processen van naderbij bekijken, blijkt dat dit waarschijnlijk enkel opgaat als deze lopers tijdens de wedstrijd positieve (in plaats van negatieve) zelfspraak gebruiken om hun doelstreven te reguleren. Dus door de mechanismen tussen het “wat” en het “waarom” van prestatiedoelen en de uitkomsten van atleten te bestuderen, brengt het huidig proefschrift *verfijning* aan in de bestaande literatuur.

Naar een meer situatie-afhankelijk perspectief op de motiverende stijl van coaches.

In het huidig proefschrift, vonden we dat behoefte-ondersteunend coachen bij atleten geassocieerd is met een meer adaptieve ervaring van hun psychologische basisbehoeften (nl. meer behoeftesatisfactie, minder behoeftefrustratie), met kwalitatievere motivatie (vb. meer autonome motivatie en minder amotivatie), alsook met een sterker engagement, meer prosicaal gedrag, en met minder verzet, woede en antisociaal gedrag. Daarentegen vonden we dat de behoefte-ondermijnende stijl van de coach geassocieerd is met een meer negatieve ervaring van hun psychologische behoeften (nl. minder behoeftesatisfactie, meer behoeftefrustratie), met minder kwalitatieve motivatie (vb. meer gecontroleerde motivatie en meer amotivatie), alsook met een minder sterk engagement, minder prosociaal gedrag, en meer verzet, woede en antisociaal gedrag. Dus, het huidig proefschrift ondersteunt het algemeen positief en negatief patroon van atleetuitkomsten dat geassocieerd wordt met, respectievelijk, een behoefte-ondersteunde en behoefte-ondermijnende coachingstijl (vb. Amorose & Anderson-Butcher, 2007; Balaguer et al., 2012; Bartholomew et al., 2011; Haerens et al., 2018; Mageau & Vallerand, 2003).

Desondanks zullen coaches en atleten het er waarschijnlijk over eens zijn dat het gedrag dat een coach stelt in de ene situatie niet persé in lijn is met het gedrag dat dezelfde coach stelt in andere situaties. Atleten kunnen bijvoorbeeld ervaren dat de coach een andere stijl hanteert tijdens wedstrijden dan tijdens trainingen (vb. vande Pol, Kavussanu, & Ring, 2013). Het huidig proefschrift ondersteunt dit situatie-afhankelijk perspectief op coaching. Ten eerste demonstreert Hoofdstuk 4 dat zowel het behoefte-ondersteunende als behoefte-ondermijnende coachgedrag kan variëren van de ene wedstrijd naar de andere. Dergelijke intrapersoonlijke variatie is congruent met het idee dat coaches beide stijlen ter beschikking hebben (Haerens et al., 2018) en dat ze deze stijlen ook in verschillende mate gebruiken tijdens de ene wedstrijd in vergelijking met de andere wedstrijd. Verder bleek dat in de wedstrijden

waarin atleten hun coach als meer behoefte-ondersteunend of behoefte-ondermijnend ervoeren, atleten meer geneigd waren om, respectievelijk, meer prosociaal of meer antisociaal gedrag te stellen naar hun tegenstanders, de scheidsrechter en hun teamgenoten. Het lijkt, met andere woorden, niet accuraat om coaches uitsluitend te categoriseren als behoefte-ondersteunend dan wel behoefte-ondermijnend. Dit zou immers geen recht doen aan de complexiteit van coaching.

In lijn met deze complexiteit, toon Hoofdstuk 5 aan dat de specifieke effecten van autonomie-ondersteunende en controlerende coachgedragingen in zekere mate beïnvloed kunnen worden door de situationele omstandigheden waarin het gedrag gesteld wordt. Meer bepaald bleken de negatieve effecten van een controlerende stijl minder schadelijk wanneer deze stijl gebruikt werd als reactie op een aantal atleten die de training verstoorden, in vergelijk met wanneer atleten moeite hadden met het leren van een vaardigheid. We nemen aan dat atleten een controlerende respons van de coach net iets meer gelegitimeerd vinden wanneer ze de training verstoren en ervaren het daarom als minder schadelijk (Way, 2011).

In lijn met de notie dat de situationele omstandigheden de perceptie van coachgedrag in zeker mate kunnen beïnvloeden, namen we in Hoofdstuk 6 de specifieke situatie in rekening bij het meten van de atleten hun percepties betreffende het motiverend gedrag van hun coach. Met name, we ontwikkelden een meetinstrument dat aan de hand van situationeel omschreven vignetten de motivationele stijl van een coach in kaart brengt (nl. de Situaties-In-Sport-vragenlijst; SISQ-Sport). Dit meetinstrument bestaat uit 15 vignetten die elk een situatie omschrijven die zich kan voordoen op training, in competitie of op de momenten dat een coach regels, normen en waarden naar zijn of haar atleten wil overbrengen. Vier verschillende items per vignet omschrijven een autonomie-ondersteunende, controlerende, structurerende of chaotische coach respons, die allen door atleten (maar ook door coaches) beoordeeld worden op de mate waarin ze overeenkomen met het gedrag dat hun coach zou stellen in de omschreven situatie. De SISQ-Sport

geniet hoge ecologische validiteit, net omdat het de situationele omstandigheden, waarin het coachgedrag gesteld wordt, in rekening brengt. Daarbovenop peilt de SISQ-sport naar de motiverende stijl van een coach in situaties die zich voordoen op training, wedstrijd en tijdens het overbrengen van regels, normen en waarden. Als gevolg is het mogelijk om na te gaan of een coach varieert in zijn/haar stijl afhankelijk van het soort omstandigheden waarmee hij of zij te maken heeft.

Het is belangrijk te benadrukken dat in alle drie de hoofdstukken de voordelen en nadelen van, respectievelijk, een behoefte-ondersteunende en behoefte-ondermijnende coachingstijl duidelijk aanwezig waren, in elk van de verschillende situationele omstandigheden en ondanks mogelijke intrapersoonlijke fluctuaties in coachingstijlen. Meer nog, in het geval dat de situatie inderdaad een invloed had op de effecten van coachingstijl, werden de effecten slechts bijgeslepen, maar nooit tenietgedaan, noch omgekeerd. Terzelfdertijd toont het huidig proefschrift aan dat coachgedrag niet in een vacuüm plaatsvindt en dat er ruimte is voor gradatie in deze algemene hoofdeffecten (Soenens, Vansteenkiste, & Van Petegem, 2015). Toekomstig onderzoek zou daarom kunnen overwegen om in te zetten op een meer situatie-afhankelijke, meer genuanceerde, visie op de motiverende stijl van de coach.

Naar een meer geraffineerd perspectief op de motiverende stijl van coaches.

In het huidig proefschrift hebben we, met verschillende mate van verfijning, een licht geworpen om de motiverende stijl van coaches. Namelijk, we onderzochten eerst de bredere behoefte-ondersteunende en behoefte-ondermijnende coachingstijl, vervolgens de meer specifieke autonomie-ondersteunende en controlerende stijl, en uiteindelijke de nog meer verfijnde autonomie-ondersteunende en controlerende coachbenaderingen.

In Hoofdstuk 4, peilden we naar de behoefte-ondersteunende coachingstijl, bestaande uit autonomie-ondersteuning en structuur, en naar de behoefte-ondermijnende stijl, bestaande uit controle en chaos. De resultaten ondersteunen het algemeen adaptief patroon dat gepaard gaat met behoefte-ondersteuning, alsook het typisch maladaptief patroon dat gerelateerd wordt aan behoefte-ondermijning. Hoofdstuk 5 zoomde specifiek in op de autonomie-ondersteunende en controlerende stijl van coaches en stelde vast dat de maladaptieve effecten van controle ietwat gereduceerd waren in een specifieke situatie (nl. atleten die de training verstoren), en ietwat meer uitgesproken in andere omstandigheden (nl. atleten die moeite hebben met een vaardigheid). Tot slot stelden we in Hoofdstuk 6 vast dat de autonomie-ondersteunende en controlerende coachingstijl elk bestaan uit twee meer verfijnde coachbenaderingen. Namelijk de autonomie-ondersteunende stijl kan onderverdeeld worden in een participatieve benadering (vb. bieden van keuze; input vragen), en een afstemmende benadering (vb. het perspectief van de atleten innemen; een rationale bieden). Deze verfijning binnen de autonomie-ondersteunende coachingstijl bleek bijzonder interessant in het licht van hun relatie met atleetuitkomsten. Namelijk de afstemmende benadering bleek ietwat sterker positief gerelateerd met de autonome motivatie van atleten en met hun oordeel over de kwaliteit van hun coach, in vergelijking met de participatieve coachbenadering. Analoog, bestaat de controlerende coachingstijl eveneens uit twee meer verfijnde coachbenaderingen; een eisende benadering (vb. het ego van de atleten aanspreken; gehoorzaamheid afdwingen) en een dominerende benadering (vb. het uitoefenen van dominantie; het gebruik van schaamte-inductie). Hier bleek eveneens dat de dominerende benadering ietwat sterker positief gerelateerd is met de gecontroleerde motivatie en de amotivatie van atleten, in vergelijking met de eisende benadering. Verder was er een even verfijnd patroon van resultaten duidelijk betreffende de twee structurerende (nl. verduidelijkende en begeleidende) en de twee chaotische (nl. de afwachtende en opgevende) coachbenaderingen.

Meer nog, wanneer alle acht de coachbenaderingen werden bekeken in relatie tot de behoeftesatisfactie en behoeftefrustratie van atleten, werd een opmerkelijk geraffineerd beeld duidelijk. Specifiek blijkt dat sommige coachbenaderingen binnen autonomie-ondersteuning (nl. afstemmende benadering) en structuur (nl. de begeleidende benadering) de behoeften van atleten rechtstreeks ondersteunen en daarom beschouwd kunnen worden als *behoefte-voedend.* Verder bleken andere autonomie-ondersteunende (nl. de participatieve) en structurerende (nl. verduidelijkende) benaderingen de behoeften op een meer indirecte manier te ondersteunen. Deze benaderingen kunnen beschouwd worden als *behoefte-activerend*, omdat ze de omstandigheden creëren waarin de behoeften van atleten bevredigd kunnen worden (Aelterman et al., 2018). Analoog stellen we vast dat sommige benadering de psychologische behoeften van atleten actief ondermijnen en daarom onmiddellijk *behoefte-ondermijnend* zijn (nl. dominerende en opgevende benadering). Andere benaderingen zijn meer *behoefte-depriverend* (nl. eisende en afwachtende benadering), omdat ze de behoeften en motivatie niet rechtstreeks ondersteunen, noch ondermijnen, maar eerder behoeftesatisfactie in de weg staan.

Samengevat, de literatuur betreffende behoefte-ondersteunend en behoefte-ondermijnend coachgedrag is uitgebreid en neemt snel toe (vb. Bartholomew et al., 2011; Haerens et al., 2015; 2018), maar het huidig proefschrift brengt een meer geraffineerd perspectief naar het veld dat de bestaande kennis kan aanvullen en het toenemend onderzoek kan verfijnen.

Naar meer overzicht betreffende de motiverende stijl van coaches.

Onderzoek naar de motiverende stijl van coaches binnen het perspectief van de Zelfdeterminatietheorie werd lang gedomineerd door het onderzoek rond autonomie-ondersteuning en controle. Recent krijgen structuur en in mindere mate ook chaos de aandacht die ze verdienen. Te midden van deze toenemende kennis over de motiverende stijlen van coaches, bestaat het gevaar om het overzicht te verliezen op hoe deze stijlen zich ten

opzichte van elkaar verhouden. Daarom biedt Hoofdstuk 6 een helikopterzicht op autonomie-ondersteuning, structuur, controle en chaos door deze stijlen in een circumplexmodel te presenteren. Aan de hand van dit omvattend beeld wordt het duidelijk dat autonomie-ondersteuning en structuur hun behoefte-ondersteunend karakter gemeen hebben, terwijl controle en chaos hun behoefte-ondermijnende aard delen. Verder hebben autonomie-ondersteuning en chaos gemeen dat ze ruimte laten aan de atleten om de leiding te nemen. Daartegenover staan structuur en controle die meer directief van aard zijn, waarbij de coach meer de leiding neemt.

Het circumplexmodel gaat nog verder en geeft weer hoe verschillende coachpraktijken die vaak samen voorkomen ook samen clusteren in acht verschillende coachbenaderingen (twee voor elke coachingstijl). Een belangrijke bijdrage van het circumplex is dat deze acht verschillende coachbenaderingen met elkaar gerelateerd zijn volgens een sinusoïde patroon over het circumplex heen, waardoor een meer gradueel perspectief op de motiverende coachingstijlen ontstaat. Zo'n sinusoïde patroon geeft namelijk aan dat de overgang tussen een specifieke coachbenadering en de benadering ernaast in het circumplex niet abrupt is, maar eerder gradueel. Het verschil tussen de benaderingen wordt bepaald door de mate waarin een specifieke coachbenadering behoefte-ondersteunend of behoefte-ondermijnend is, alsook de mate waarin de coach meer of minder directief is wanneer hij of zij die specifieke benadering toepast. De verschillende coachingstijlen werden in voorgaand onderzoek hoofdzakelijk beschouwd als duidelijk te onderscheiden categorieën (vb. Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010; Mageau & Vallerand, 2003). Niettemin, het huidige circumplexmodel suggereert dat, in plaats van een categorisch perspectief, een meer gradueel perspectief aanbevolen is.

Conclusie

Het huidig proefschrift had als doel een meer verfijnde en geïntegreerde visie op de motivatie van atleten en de motiverende stijl van coaches te geven. Ten eerste onderzochten twee empirische studies zowel het "wat" als het "waarom" van het prestatiedoelstreven van atleten. De resultaten geven aan dat niet alle prestatiedoelen gelijk gecreëerd zijn, en dat de gedifferentieerde prestaties en ervaringen van atleten met hetzelfde doel deels verklaard kunnen worden door de onderliggende redenen voor het doelstreven. Ten tweede bieden drie empirische bijdrages over de behoefte-ondersteunende en behoefte-ondermijnende coachingstijl steun voor de algemene voordelen en nadelen met betrekking tot de motivatie, emoties en het moreel gedrag van atleten. Terzelfdertijd neemt het huidig proefschrift ook de complexiteit van sport coaching in acht. Namelijk, de resultaten geven aan dat de perceptie van atleten over het motiverend gedrag van hun coach kan fluctueren van wedstrijd tot wedstrijd. Ook, de sterkte van de effecten van het motiverend gedrag op de motivationele en emotionele ervaringen van atleten kan in zekere mate beïnvloed worden door de situationele omstandigheden waarin het motiverend coachgedrag wordt gesteld. Tot slot, kunnen de motiverende coachingstijlen voorgesteld worden door een circumplexmodel, waarin de onderlinge relaties tussen coachingstijlen en de meer verfijnde coachbenaderingen op een graduele manier gepresenteerd worden. De resultaten van het huidig proefschrift kunnen toekomstig onderzoek helpen om de motivatie van atleten en de motiverende stijl van coaches op een meer genuanceerde manier te bekijken.

Appendix

Data Storage Fact Sheets

% Data Storage Fact Sheet (versie 7 maart 2014)

% Name/identifier study: Psybel_ 2016_Delrue, Mouratidis, Haerens, De Muynck, Aelterman, & Vansteenkiste (Dissertation: Chapter 2)
% Author: Jochen Delrue
% Date: 13/04/2018

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2. Information about the datasets to which this sheet applies

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* Reference of the publication in which the datasets are reported: Delrue, D., Mouratidis, A., Haerens, L., De Muynck, G-J., Aelterman, N., & Vansteenkiste, M. (2016). Intrapersonal Achievement Goals and Underlying Reasons among Long Distance Runners: Their Relation with Race Experience, Self-Talk, and Running Time. Psychologica Belgica, 56, 288-310.

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% Name/identifier study: NP_ 2018_Delrue, Vansteenkiste, Haerens, De Muynck, Vande Broek, & Mouratidis (Dissertation: Chapter 3)
% Author: Jochen Delrue
% Date: 13/04/2018

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* Reference of the publication in which the datasets are reported: Delrue, D., Vansteenkiste, M., Haerens, L., De Muynck, G-J., Vande Broek, G., & Mouratidis, A. (2018). On the Game-to-game Variation in Soccer Players' Reasons Underlying Task-approach Goal Pursuit and Performance: The Role of Challenge and Threat Appraisals. Submitted

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% Name/identifier study: PSE_ 2017_ Delrue, Vansteenkiste, Mouratidis, Gevaert, Vande Broek, & Haerens, L. (Dissertation: Chapter 4)
% Author: Jochen Delrue
% Date: 13/04/2018

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* Reference of the publication in which the datasets are reported: Delrue, J., Vansteenkiste, M., Mouratidis, A., Gevaert, K., Vande Broek, G., & Haerens, L. (2017). A game-to-game investigation of the relation between need-supportive and need-thwarting coaching and moral behavior in soccer. Psychology of Sport and Exercise, 31, 1-10.

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% Name/identifier study: NP_ 2018_Delrue, Haerens, Morbée, Aelterman, Soenens, Mouratidis, & Vansteenkiste (Dissertation: Chapter 5)
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% Date: 13/04/2018

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If a response is not received when using the above contact details, please send an email to data-ppw@ugent.be or contact Data Management, Faculty of Psychology and Educational Sciences, Henri Dunantlaan 2, 9000 Ghent, Belgium.

2. Information about the datasets to which this sheet applies

==========

* Reference of the publication in which the datasets are reported: Delrue, D., Haerens, L., Morbée S., Aelterman, N., Soenens, B., Mouratidis, A., & Vansteenkiste, M. (2018). Do Athletes' Responses to Coach Autonomy Support and Control Depend on the Situation and Athletes' Personal Motivation? Submitted.

* Which datasets in that publication does this sheet apply to?: Main Study

3. Information about the files that have been stored

==========

3a. Raw data

---

* Have the raw data been stored by the main researcher? [X] YES / [ ] NO
If NO, please justify:

* On which platform are the raw data stored?
- [X] researcher PC
- [X] research group file server
- [ ] other (specify): ...

* Who has direct access to the raw data (i.e., without intervention of another person)?
  - [X] main researcher
  - [X] responsible ZAP
  - [X] all members of the research group
  - [ ] all members of UGent
  - [ ] other (specify): ...

3b. Other files

---

* Which other files have been stored?
  - [X] file(s) describing the transition from raw data to reported results. Specify: SPSS syntax file for transition raw data in used variables
  - [X] file(s) containing processed data. Specify: .ws file for Mlwin data
  - [ ] file(s) containing analyses. Specify:
  - [ ] files(s) containing information about informed consent. Specify: ...
  - [ ] a file specifying legal and ethical provisions. Specify: ...
  - [ ] file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...
  - [ ] other files. Specify: ...

* On which platform are these other files stored?
  - [X] individual PC
  - [X] research group file server
  - [ ] other: ...

* Who has direct access to these other files (i.e., without intervention of another person)?

- [X] main researcher
- [X] responsible ZAP
- [X] all members of the research group
- [ ] all members of UGent
- [ ] other (specify): ...

4. Reproduction

==========

* Have the results been reproduced independently?: [ ] YES / [X] NO

* If yes, by whom (add if multiple):

- name:
- address:
- affiliation:
- e-mail:

% Data Storage Fact Sheet (versie 7 maart 2014)

% Name/identifier study: NP_ 2018_Delrue, Reynders, Aelterman, De Backer, Decroos, De Muynck, Fontaine, et al. (Dissertation: Chapter 6)
% Author: Jochen Delrue
% Date: 13/04/2018

1. Contact details

==========

1a. Main researcher

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1b. Responsible Staff Member (ZAP)

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- address: Henri Dunantlaan 2, 9000 Ghent, Belgium
- e-mail: maarten.vansteenkiste@ugent.be

If a response is not received when using the above contact details, please send an email to data-ppw@ugent.be or contact Data Management, Faculty of Psychology and Educational Sciences, Henri Dunantlaan 2, 9000 Ghent, Belgium.

2. Information about the datasets to which this sheet applies

==========

* Reference of the publication in which the datasets are reported: Delrue*, D., Reynders*, B., Aelterman, N., De Backer, M., Decroos, S., De Muynck, G-J., Fontaine, J. et al. (2018). Adopting a Helicopter-perspective towards Motivating and Demotivating Coaching: A Circumplex Approach. In revision. *equal contributions.

* Which datasets in that publication does this sheet apply to?: Main Study

3. Information about the files that have been stored

==========

3a. Raw data

---

* Have the raw data been stored by the main researcher? [X] YES / [ ] NO
If NO, please justify:

* On which platform are the raw data stored?
- [X] researcher PC
- [X] research group file server
- [ ] other (specify): ...

* Who has direct access to the raw data (i.e., without intervention of another person)?
 - [X] main researcher
 - [X] responsible ZAP
 - [X] all members of the research group
 - [ ] all members of UGent
 - [X] other (specify): Bart Reynders (bart.reynders@kuleuven.be); shared first authorship

3b. Other files

---

* Which other files have been stored?
 - [X] file(s) describing the transition from raw data to reported results. Specify: SPSS syntax files for transition raw data in used variables
 - [X] file(s) containing processed data. Specify: .ws file for Mlwin data; .dat file for Mplus data
 - [X] file(s) containing analyses. Specify: Mplus file containing analyses
 - [ ] files(s) containing information about informed consent. Specify: ...
 - [ ] a file specifying legal and ethical provisions. Specify: ...
 - [ ] file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...
 - [ ] other files. Specify: ...

* On which platform are these other files stored?
 - [X] individual PC
 - [X] research group file server
 - [ ] other: ...

* Who has direct access to these other files (i.e., without intervention of another person)?

- [X] main researcher
- [X] responsible ZAP
- [X] all members of the research group
- [ ] all members of UGent
- [X] other (specify): Bart Reynders (bart.reynders@kuleuven.be); shared first authorship

4. Reproduction

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* Have the results been reproduced independently?: [ ] YES / [X] NO

* If yes, by whom (add if multiple):

- name:
- address:
- affiliation:
- e-mail: